SMITHSONIAN INSTITUTION

Contributions from the United States National Herbarium
Volume 49: 1-152

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Acanthaceae of Bolivia

by

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Washington, DC
2004

ABSTRACT

Wasshausen, Dieter C., and J. R. I. Wood. Acanthaceae of Bolivia. *Contributions from the United States National Herbarium*, volume 49: 152 pages (including 42 figures).—Recent fieldwork in Bolivia has resulted in the recognition of 180 species in 36 genera of Acanthaceae. The purpose of this taxonomic treatment is to discuss, in alphabetical order, all the known Bolivian species of the family, and as such, this work is a ready reference for botanists, so that they may identify their collections of acanthaceous plants or use the keys for detecting further undescribed species. Except for brief discussions to indicate possible relationships of the novelties to allied species, no phylogenetic inferences within the family have been made. A full list of synonyms for the Bolivian species and those of adjoining countries has been prepared. Keys, species descriptions, and specimen distribution data is provided. When available, illustrations, ecological and conservation data have been included. Two new species of ***Dicliptera***, ***D. palmariensis*** and ***D. purpurascens*** are described and illustrated, and ***Lepidagathis alverezia*** is a new combination. The following 26 names are lectotypified: *Ancylogyne peruviana*, *Aphelandra albadenia*, *Aphelandra simplex*, *Arrhostoxylum haenkeanum*, *Beloperone denudata*, *Beloperone matthewsii*, *Beleperone nodicaulis*, *Chaetochlamys ciliata*, *Chaetochlamys macrosiphon*, *Chaetothylax boliviensis*, *Chaetothylax tocantinus*, *Dicliptera pohliana*, *Dicliptera seriacea*, *Dicliptera squarrosa*, *Geissomeria tetragona*, *Justicia diamantina*, *Justicia dubiosa*, *Justicia yurimaguensis*, *Leptostachya parviflora*, *Mendoncia meyeniana*, *Orthotactus strobilacea*, *Pachystachys lutea*, *Porphyrocoma lanceolata*, *Ruellia glischrocalyx*, *Ruellia haenkeana*, and *Stephanophysum ruizianum*.

KEY WORDS: Acanthaceae, Bolivia, Nomenclature, Taxonomy.

DATE OF PUBLICATION: May 2004

Cover Design by Alice Tangerini: front, habit of *Suessenguthia wenzelii* Schmidt-Lebuhn illustrated by ART; back, detail of *Aphelandra castanifolia* Britton ex Rusby illustrated by Cathy Pasquale, and *Dyschorista boliviana* Wassh. & J.R.I.Wood illustrated by ART.

Contributions from the United States National Herbarium (ISSN 0097-1618) Department of Botany, National Museum of Natural History, MRC-166, Smithsonian Institution, Washington, DC, 20013-7012, USA.

POSTMASTER: Send address changes to Contributions from the U.S. National Herbarium, Department of Botany, National Museum of Natural History, MRC-166, P.O. Box 37012, Smithsonian Institution, Washington, DC, 20013-7012, USA.

The paper used in this publication meets the minimum requirements of the American National Standard for Permanence of Paper for Printed Library Materials Z39.48—1984.

The periodical, Contributions from the United States National Herbarium, was first published in 1890 by The United States Department of Agriculture. From 1 July 1902 forward it was published as a Bulletin of the United States National Museum. The series was discontinued after volume 38 (1974), and has been revived with volume 39 (2000) as a venue for publishing longer taxonomic papers, checklists, floras, and monographs, produced by the staff and associates at the U.S. National Herbarium. It is externally peer reviewed, and published at irregular intervals. Subscription and other correspondence should be addressed to CUSNH, Department of Botany, National Museum of Natural History, MRC-166, Smithsonian Institution, Washington, DC, 20013-7012, USA e-mail: CUSNH@nmnh.si.edu. The present issue is available for free while supplies last.

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Acanthaceae of Bolivia

Dieter C. Wasshausen[1] and J. R. I. Wood[2]

INTRODUCTION

The Acanthaceae are a large and diverse pantropical family consisting of approximately 240 genera and 3250 species. In the New World there are approximately 85 genera and 2000 known species. The two largest neotropical genera, *Justicia* (350-600 species) and *Ruellia* (ca. 250 species), are prominently distributed in Bolivia with 48 and 28 species, respectively. Of the remaining 34 genera in Bolivia, 23 are known from a single species, and except for *Aphelandra, Dicliptera, Dyschoriste, Mendoncia, Stenostephanus,* and *Suessenguthia*, the remaining genera possess only two or three species each.

The family can be recognized by the prominent cystoliths, appearing under magnification with a hand lens as small, usually elongate, calcium carbonate and oxalate concretions on the upper surface of the leaves, the younger stems, the branches of the inflorescence, and the calyx. In Bolivia genera lacking these deposits are few. However, species of *Thunbergia, Mendoncia, Acanthus, Stenandrium* and *Aphelandra* lack cystoliths. Of these, only *Thunbergia* and *Mendoncia* are vines and feature either a capsule that is seed-bearing at the base and crowned by a long, stout beak or a drupaceous fruit with a fleshy mesocarp, respectively. In most genera the seeds are frequently ejected forcefully by jaculators on the funicle (retinacula) when the mature capsules are either drying or moistened by rainfall. In opened capsules the jaculators can be seen with the naked eye as hook-shaped, apically forked projections. The family possesses numerous life forms including many hygrophiles, xeromorphic species with spiny or acicular leaves, lianas, and even mangrove plants (but not in Bolivia). Arborescent forms are rare; most species are shrubs or herbs with opposite, usually decussate, entire, exstipulate leaves.

The major economic importance of the family is horticultural. Species of *Acanthus, Aphelandra, Eranthemum, Hemigraphis, Hypoestes, Justicia, Odontonema, Thunbergia,* and some other genera are sometimes cultivated as ornamentals. Of these, *Asystasia gangetica, Hypoestes phyllostachya, Odontonema cuspidatum*, species of *Thunbergia*, especially *T. alata* and *Sanchezia parvibracteata,* were all introduced into Bolivia as cultivars, and these have become naturalized and persist as escapes. The remaining introduced species, *Acanthus mollis, Eranthemum pulchellum, Hemigraphis alternata, Justicia brandegeana, J. carnea, J. floribunda,* and *J. scheidweileri* are presently cultivated in Bolivia but do not appear to have become naturalized or persist as escapes. A few plants have been reported to have medicinal properties but, to date, none are included in present works of *materia medica.*

The following work was undertaken to place on record all of the known and described species of Acanthaceae in Bolivia, exclusive of undiscovered new taxa, for the convenience of other taxonomists prior to the preparation of a monograph of the family. All types were seen unless otherwise noted.

ACKNOWLEDGMENTS

The authors would especially like to thank Alice Tangerini and Cathy Pasquale who skillfully prepared the line drawings. We express our appreciation to the National Herbarium in La Paz (LPB), the Museo Noel Kempf Mercado (UCZ) in Santa Cruz, the Natural History Museum in London (BM), and the New York Botanical Garden (NY) for the loan of specimens used in this study. Our sincerest thanks to Stephen F.

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Smith and Marjorie Knowles for all the help and expertise that they provided with the word-processing of this manuscript. John Wood would like to thank all the institutions mentioned as well as the Royal Botanic Gardens, Kew (K)and the Smithsonian Institution (US) for facilities provided during his visit, and the Smithsonian Institution's Office of Fellowships and Grants for a Short-term visitor award.

TAXONOMIC TREATMENT

Acanthaceae

References: Bentham, G. & J.D. Hooker, Acanthaceae. In Genera Plantarum 2: l060-1122 (1876). — Leonard, E.C., The Acanthaceae of Colombia, I. Contr. U.S. Natl. Herb. 31(1): 1-117 (1951); The Acanthaceae of Colombia, II. Contr. U.S. Natl. Herb. 31(2): 119-322 (1953); The Acanthaceae of Colombia III. Contr. U.S. Natl. Herb. 31(3): 323-781 (1958). — Lindau, G., In A. Engler and K. Prantl, Die Natürlichen Pflanzenfamilien 4(3b): 274-354 (1895). — Nees von Esenbeck, C.G., Acanthaceae. In C.F.P. von Martius (ed.), Flora Brasiliensis 9: 1-164 (1847a); Acanthaceae. In A.P. De Candolle, Prodromus Systematis Naturalis Regni Vegetabilis 11: 46-519 (1847b).

Prostrate, erect or, rarely climbing herbs, shrubs or, less often, small trees or twining perennial vines. Branches decussate, frequently angled, more rarely terete, often with transverse ridges across the node. Leaves opposite or subopposite, exstipulate, simple, usually with cystoliths (intercellular concretions, usually of calcium carbonate, which appear as white streaks on the upper surface, but lacking in *Mendoncia*, *Acanthus*, *Thunbergia*, *Stenandrium*, and *Aphelandra*), the margins entire or undulate. Inflorescence axillary or terminal, the flowers solitary or arranged in spikes, cymes or racemes, often densely clustered, frequently in axils of conspicuous bracts and with two bracteoles; bracts often leaf-like, sometimes enclosing the corolla tube. Flowers zygomorphic to nearly actinomorphic, bisexual; calyx synsepalous at least basally, persistent, the lobes 4 or 5, rarely (*Thunbergia*, *Mendoncia*) an entire ring, cupular or truncate or 12-20-lobed; corolla sympetalous, the limb 5-lobed or 2-lipped (rarely 1-lipped), the lobes imbricate or contorted in bud, basally usually divided into a distinct narrow tube and wider throat; stamens 4, usually didynamous, or 2 fertile and sometimes accompanied by 1 or 2 staminodes, adnate to the corolla tube; filaments free or basally connate in pairs; anther thecae usually 1 or 2, usually parallel rarely divergent or transverse, muticous (without a projection), obtuse or rounded, or basally spurred, longitudinally dehiscent; pollen varied in structure, usually tricolporate; disk annular and nectar-producing at base of ovary; ovary 2-celled, superior, either with 2 collateral (*Thunbergia*, *Mendoncia*) or more commonly 2-10 superposed ovules per locule; placenta exile; style filiform, simple; stigma entire or more commonly 2-lobed, one lobe frequently smaller than the other. Fruit drupaceous (*Mendoncia*) or, more commonly, a loculicidal, 2-valved capsule, with 2-many seeds, frequently explosively dehiscent either on drying or on wetting, the seeds usually borne on hook-like funicles (retinacula), these persistent in the capsule after seeds have been discharged, or funicles lacking (*Thunbergia*); seeds usually flattened, the testa smooth or roughened, sometimes with mucilaginous trichomes which expand when moistened.

KEY TO THE GENERA

1a. Plant scandent; fruit drupaceous or ovoid, capsular with long sterile beak, much narrower than the seed-bearing basal portion; calyx unlobed (annular) to irregularly many-dentate or lobed 2

1b. Plants not scandent (very rarely so in one species of *Ruellia* and two of *Justicia*); fruit capsular, beak absent or, if present, similar in width to the seed-bearing portion of the capsule; calyx 2-5-lobed 3

2a. Native species of forested areas with drupaceous fruit; pollen 5-brevicolporate ..... *19. Mendoncia*
2b. Introduced species found near settlements with long-beaked, capsular fruit; pollen spiraperturate. ..... *36. Thunbergia*

3a. Leaves deeply lobed or incised, often spiny-margined; cystoliths absent 4
3b. Leaves entire to undulate-margined, never spiny-margined; cystoliths present or absent 5

4a. Introduced species; upper corolla lip absent; leaves forming a basal rosette ..... *2. Acanthus*
4b. Native species; corolla 2-lipped; leaves not arranged in a basal rosette ..... *4. Aphelandra*

5a. Calyx 4-lobed *6*
5b. Calyx 5-lobed 9

6a. Trailing herb; fertile stamens 2; bracteoles absent ..... *20. Nelsonia*
6b. Erect herbs or undershrubs; fertile stamens 4, 2 in *Justicia*; bracteoles present 7

7a. Inflorescence a scape, the peduncle covered with coriaceous and clasping scales; stigma touch-sensitive; leaves clustered into a pseudowhorl on the stem; seeds 12-16 ..... *9. Elytraria*
7b. Inflorescence not scapose; stigma not touch-sensitive; leaves alternate; seeds 4 8

8a. Calyx formed of two pairs of dissimilar lobes; stamens ad style exserted ..... *18. Lepidagathis*
8b. Calyx subequally 4-lobed; stamens and style included. ..... *17. Justicia*

9a. Fertile stamens usually 4 (or if 2 as in *Sanchezia*, then with 2 conspicuous staminodes) 10
9b. Fertile stamens usually 2 24

10a. Anthers 1-thecous; cystoliths absent; corolla imbricate in bud; pollen 3-colporate 11
10b. Anthers 2-thecous or anthers of the longer pair 2-thecous, those of the shorter pair 1-thecous (*Herpetacanthus*, *Acanthura*); cystoliths present; corolla contorted in bud; pollen otherwise 13

11a. Corolla subactinomorphic, rose-colored or pale lilac, with cylindric incurved tube, the throat puberulous within, the limb oblique, spreading, 5-lobed, the lobes similar in form ..... *31. Stenandrium*
11b. Corolla zygomorphic, cream yellow, red-orange, pink, or red, the tube gradually expanding from base, some curved but not incurved, the throat glabrous within, the limb bilabiate to subregular, the upper lip erect, bilobed, the lower lip 3-lobed, the lobes erect or spreading, if spreading then the lateral lobes often reduced 12

12a. Leaf blades rarely conspicuously veined, commonly with spinose-dentate margins; spikes 1 to several, rarely in 3's; corolla limb at least one third the length of the corolla, the lower lip spreading, 3-lobed; bracts imbricate, usually exceeding the calyx lobes, margins often crenate; capsule nearly globose, green when immature, brown and conspicuously wrinkled at dehiscence ..... *4. Aphelandra*
12b. Leaf blades conspicuously veined, margins entire; spikes commonly in 3's or 5's; corolla limb less than one eighth the length of the corolla tube, the lower lip erect; bracts small, barely imbricate, forming a somewhat more lax inflorescence, margins entire; capsule thick, oval, nitid, drying brownish, not conspicuously wrinkled at dehiscence ..... *12. Geissomeria*

13a. Inflorescence of densely bracted, elongate, 4-sided dichasiate spikes; bracts imbricate, ovate-lanceolate to ovate to oblong to suborbicular, green or green and turning indigo upon drying 14
13b. Inflorescence and bracts otherwise 15

14a. Plants sprawling or erect perennial herbs 35-70 cm; leaf blades lanceolate, green both above and below ..... *6. Blechum*
14b. Plants low-growing diffuse herbs 30-35 cm; leaf blades broadly ovate to ovate-oblong to cordate, firm, the underside purple, portions turning indigo upon drying; native to Indonesia, species is cultivated in gardens in Bolivia and occasionally escaped ..... *13. Hemigraphis*

15a. Stamens 4 or 2, at least 2 exserted well beyond mouth of the corolla; shrubs 1-6 m; calyx lobes overlapping one another; seeds glabrous; pollen loxodicolporate 16

15b.Stamens 4, usually included, not exserted appreciably beyond mouth of the corolla; herbs, subshrubs or shrubs to 2.5 m, rarely climbing to 3 m; calyx lobes not overlapping one another; seeds pubescent (at least around margin); pollen otherwise 17

16a.Stamens 4, the larger 2 exserted, the shorter 2 included or barely reaching the corolla throat; corollas conspicuously 5-lobed, lobes 10-15 mm long and 10-15 mm wide, spreading, not revolute; capsule 8-seeded. ..... *34. Suessenguthia*
16b.Stamens 2, exserted, the staminodes 2, included; corolla subcylindric, lobes small, rather inconspicuous, 4-6 mm long and 2.5-4 mm wide, revolute; capsule 6-8-seeded ..... *28. Sanchezia*

17a.Anthers of the longer pair of stamens 2-thecous, thecae superposed or somewhat obliquely attached to the connective, those of the shorter pair of stamens 1-thecous; pollen 3-colporate, mesocolpia multistriate with 6 pseudocolpi 18
17b.Anthers of both pairs of didynamous stamens 2-thecous, thecae equally attached to connective; pollen otherwise. 20

18a.Corolla bright red or scarlet, 35 mm long; flowers unilateral; bracts inconspicuous; woody herb, subshrub or shrub 0.8-2.5 m ..... *24. Pranceacanthus*
18b.Corolla white or pale violet, 15-16 mm long; flowers alternate, in pairs or singly between paired bracts; bracts conspicuous; herb or subshrub 0.25-1.5 m 19

19a.Leaves sessile, blades linear-lanceolate; bracts lanceolate, glandular-pubescent; calyx lobes unequal, lateral lobes shorter ..... *1. Acanthura*
19b.Leaves petiolate, blades elliptic to narrowly ovate; bracts ovate-orbicular, glabrous; calyx lobes subequal .... *14. Herpetacanthus*

20a.Thecae basally awned or mucronate; pollen 3-corporate, mesocolpia multistriate with 4-15 pseudocolpi .... *8. Dyschoriste*
20b.Thecae lacking basal awns or mucros; pollen otherwise 21

21a.Inflorescence of secund racemes, corolla yellow with purplish throat ..... *5. Asystasia*
21b.Inflorescence an axillary, branching, long-peduncled dichasium or cyme or, 1-2 (3) more or less sessile, occasionally long pedicellate flowers in upper axils, combined into a terminal raceme or spike; corollas variously colored, but not yellowish with purple throat 22

22a.Corolla white, 6-9 mm long, the limb zygomorphic (2 lobes of the upper lip considerably smaller than the lobes of the lower lip); capsule estipitate 23
22b.Corolla white, blue, pink, purple or red, 15-100 mm long, or if white then 40-100 mm long, the limb subactinomorphic (or at least the 5 lobes subequal in size); capsule stipitate; pollen 3-porate, exine coarsely reticulate ..... *27. Ruellia*

23a.Flowers solitary or fascicled, axillary; calyx lobes hyaline-margined, basally fused to form a tube; pollen 4-colporate, mesocolpia multistriate with 3-6 pseudocolpi ..... *15. Hygrophila*
23b.Flowers in terminal spikes; calyx lobes free to the base, green ..... *30. Staurogyne*

24a.Anthers 1-thecous 25
24b.Anthers 2-thecous 26

25a.Leaf blades beset with pink spots; bracts (when present) usually petiolate, those of a pair heteromorphic with fertile ones larger than sterile ones; bracteoles in 2 pairs, outer pair partially connate, inner pair partially adnate to outer pair; corolla resupinate 180 (i.e. lower 3-lobed lip uppermost); pollen 3-colporate, mesocolpia multistriate with 6 pseudocolpi; plants naturalized ..... *16. Hypoestes*
25b.Leaf blades entirely green; bracts (when present) sessile, those of a pair homomorphic; the bracteoles in 1 pair, not connate; corolla not resupinate (i.e. lower 3-lobed lip, when evident, lowermost); pollen 2-porate with gemmate region enclosing aperature; plants native ..... *32. Stenostephanus*

26a.Androecium of 2 fertile stamens and 2 staminodes; flowers sometimes heterostylous 27
26b.Androecium of 2 fertile stamens and no staminodes; flowers never heterostylous 31

27a.Flowers heterostylous; corolla limb equally or subequally 5-lobed 28
27b.Flowers rarely heterostylous; corolla limb 2-lipped (weakly so in *Odontonema*) 29

28a.Inflorescence a trichotomously branched panicle formed of short, subsessile, terminal spikes; bracts imbricate, conspicuously variegated white and green; native to eastern India, cultivated in gardens in Bolivia ..... *10. Eranthemum*
28b.Inflorescence of dichasia in upper leaf axils, 1-3-flowered, pedunculate; bracts inconspicuous, opposite, green; native plants ..... *25. Pseuderanthemum*

29a.Flowers either solitary in leaf axils or borne on comparatively few-flowered axillary fascicles; corolla white. ..... *22. Oplonia*
29b.Flowers borne in crowded terminal raceme or panicle with 3 to many flowers in fascicles; corolla lilac with darker spots on limb or red to reddish-purple 30

30a.Corolla red to reddish-purple, weakly bilabiate, lobes not dotted, the tube long, slender, straight; anthers included within corolla; rachis and calyx glabrous or pubescent, rarely glandular-puberulent; plants cultivated ..... *21. Odontonema*
30b.Corolla lilac with darker spots on limb, strongly bilabiate, the tube short, broad and curved; anthers exserted; rachis and calyx glandular-puberulent; plants native ..... *26. Pulchranthus*

31a.Anther thecae parallel to subsagittate, nearly equal in length 32
31b.Anthers variously l- or 2-lobed, the thecae superposed, usually dissimilar in length 37

32a.Corolla tube conspicuously long and slender, less than 1 mm wide; leaves in a basal rosette with apex consisting only of flowering spikes; blades cordate at base ..... *33. Streblacanthus*
32b.Corolla tube not slender, more than 2 mm wide; leaves not in a basal rosette; blades not cordate at base 33

33a.Inflorescence of densely bracteate spikes; bracts green, imbricate or somewhat spreading 34
33b.Inflorescence otherwise; bracts, if present, neither imbricate nor somewhat spreading 36

34a.Perennial herbs or subshrubs; leaf blades not with any conspicuous venation; corolla crimson, scarlet or blue, 17-70 mm long 35
34b.Creeping herbs, rooting at the nodes with stems ascending; leaf blades with a conspicuous reddish reticulate venation; corolla lemon-yellow or with slightly purplish tinge on the outside, 10-14 mm long ..... *11. Fittonia*

35a.Corolla crimson or scarlet, 55-70 mm long, the limb bilabiate, not appearing 4-parted, the upper lip minutely bilobed; suffrutescent shrub, 70-400 cm; stem without exfoliating epidermis ..... *23. Pachystachys*
35b.Corolla blue, 17-22 mm long, the limb bilabiate, appearing 4-parted, the upper lip emarginate; perennial herb or subshrub to 45 cm; stem with exfoliating epidermis ..... *35. Tetramerium*

36a.Subshrub with leaf blades usually caducous during flowering; flowering spike secund; corolla red ..... *3. Anisacanthus*
36b.Shrub or Subshrub with leaf blades present during flowering; flowering spike densely compacted, not secund; corolla cream-yellowish to white to yellowish ..... *29. Schaueria*

37a.Stems hexagonal; inflorescence of axillary bracteate cymes bearing 1 or more sessile to pedunculate cymules; cymules consisting of 1 or more flowers subtended by an involucre of 2 or more pairs of bracteoles; outer pair of cymule bracteoles conspicuous and larger than inner pair(s); retinacula separating from inner capsule wall at maturity and protruding prominently from each valve of capsule, mature capsule conspicuously ruptured near base of head; corolla sometimes resupinate 180 ..... *7. Dicliptera*
37b.Stems terete to quadrate; inflorescence various but not as described above; cymules never present; flowers subtended by 1 pair of bracteoles; retinacula remaining attached to inner capsule wall at maturity, protruding prominently from each valve of capsule, mature capsule not ruptured near base of head; corolla never resupinate. ..... *17. Justicia*

CATALOGUE OF THE BOLIVIAN SPECIES OF ACANTHACEAE

1. **Acanthura** Lindau

Acanthura mattogrossensis Lindau, Bot. Jahrb. Syst. 30: 197. 1901. TYPE: Brazil, Mato Grosso, upper Kulisehu, *Meyer 729* (holotype B, destroyed; F photo B8694). Fig. 1.

Unbranched herb; leaves sessile, linear-lanceolate, glabrous; inflorescence of dense, axillary spikes, these short or terminal exceeding upper leaves; bracts and bracteoles equal, lanceolate, glandular-pubescent; calyx 5-lobed, lobes unequal, lateral lobes shorter; corolla pale lilac, pilose without, 2-lipped, lower lip 3-lobed, upper lip 2-lobed; stamens 4, didynamous, anterior pair 2-thecous, posterior pair 1-thecous, the thecae equal, basally obtuse.

Monotypic genus known from only 3 collections from eastern Bolivia and adjacent parts of Mato Grosso, Brazil. A threatened species by IUCN classification.

Specimens examined: SANTA CRUZ: Velasco, *Killeen 7611* (MO, USZ); *Bruderreck 173* (LPB, US).

2. **Acanthus** L.

Acanthus mollis L., Sp. Pl. 639. 1753. TYPES: Italy and Sicily. Herb. Cliff. BM (lectotype n.v.); fide *Hossain 1982*. Fig. 2.

Perennial 0.5-0.8 m; leaves in basal rosette, large with margins divided or incised; inflorescence an erect spike arising from basal leaf rosette; bracts conspicuous, ovate, the margin spiny-toothed; corolla white, the tube short, lower lip large, shortly 3-lobed, upper lip lacking; stamens 4, in equal pairs; anthers 1-thecous, bearded along sutures.

Introduced and cultivated.

Specimens examined: LA PAZ: Murillo. Plantas ornamentales, *Solomon 17299* (MO, NY).

3. **Anisacanthus** Nees

Anisacanthus boliviensis (Nees) Wassh., Novon 2:149. 1992. - *Drejera boliviensis* Nees, in DC., Prodr. 11:334. 1847. TYPE: Bolivia. Chiquitos, *D'Orbigny 786* (lectotype G, Wasshausen 1992: 149; isolectotype GZU).
Anisacanthus caducifolius (Griseb.) Lindau, Bot. Jahr. Syst. 19, Beibl. 48:18. 1894. *Jacobinia caducifolia* Griseb., Symb. Fl. Argent. 261. 1879. TYPE: Argentina, Oran, *Lorentz & Hieronymus 926* (holotype GOET; isotype CORD). Fig. 3.

Sprawling herbs or subshrubs; leaves blades caducous, ovate, entire; inflorescence spicate, the flowers borne singly at a node, secund; bracts not conspicuous, usually caducous, similar to calyx in pubescence; corolla red, puberulous, tubular, arcuate, 2-lipped, lower lip 3-lobed, upper lip entire or emarginate; stamens 2; anthers 2-thecous. Species is found in dry thorny scrub on soft sandstone weathering to sand, in Bolivia, Mato Grosso do Sul, Brazil and in northern Argentina.

Species of dry thorny scrub along the western and northern margins of the chaco in Mato Grosso do Sul, Brazil, in northern Argentina and Bolivia where it extends westwards along the Rio Grande valley system. Flowering principally in the dry season from about March to October when the plant is commonly leafless.

Specimens examined: COCHABAMBA: Campero, *Antezana 584* (BOLV, US), *López & Saravia 215* (BOLV, US). SANTA CRUZ: Chiquitos, *Daly 2230* (LPB, NY); Velasco, *Beck & Seidel 12394* (LPB, US), *Seidel 662* (LPB, US); Ñuflo de Chávez, *Fuentes 477* (LPB, USZ), *Wood 12509* (K, LPB, US); Cordillera, *Brooke 5558* (BM, NY), *5569* (BM, NY), *Cárdenas 2007* (US), *Beck & Liberman 9413* (LPB, NY, US), *Peredo 491* (LIL, NY), *Cabrera & Gutiérrez 33697* (LPB, SI); Angostura, *R. Steinbach 335* (MO, NY, US); Pulquina, *Cárdenas 4635* (US); Ibanez, *Fuentes et al. 3286* (USZ); Vallegrande, *Kessler 5285, 5292* (LPB, US); Caballero, *Balcázar 358* (MO), *Wasshausen et al. 2030* (CAS, CORD, GOET, LPB, NY, US). CHUQUISACA: Calvo, *Killeen 4166* (LPB, MO, US), *Saravia 11391* (CTES, US). TARIJA: Gran Chaco, *Krapovickas 19284, 19321* (US). WITHOUT PRECISE LOCALITY: Pampas, June 1864, *Pearce s.n.* (K); *Kuntze s.n.* (NY).

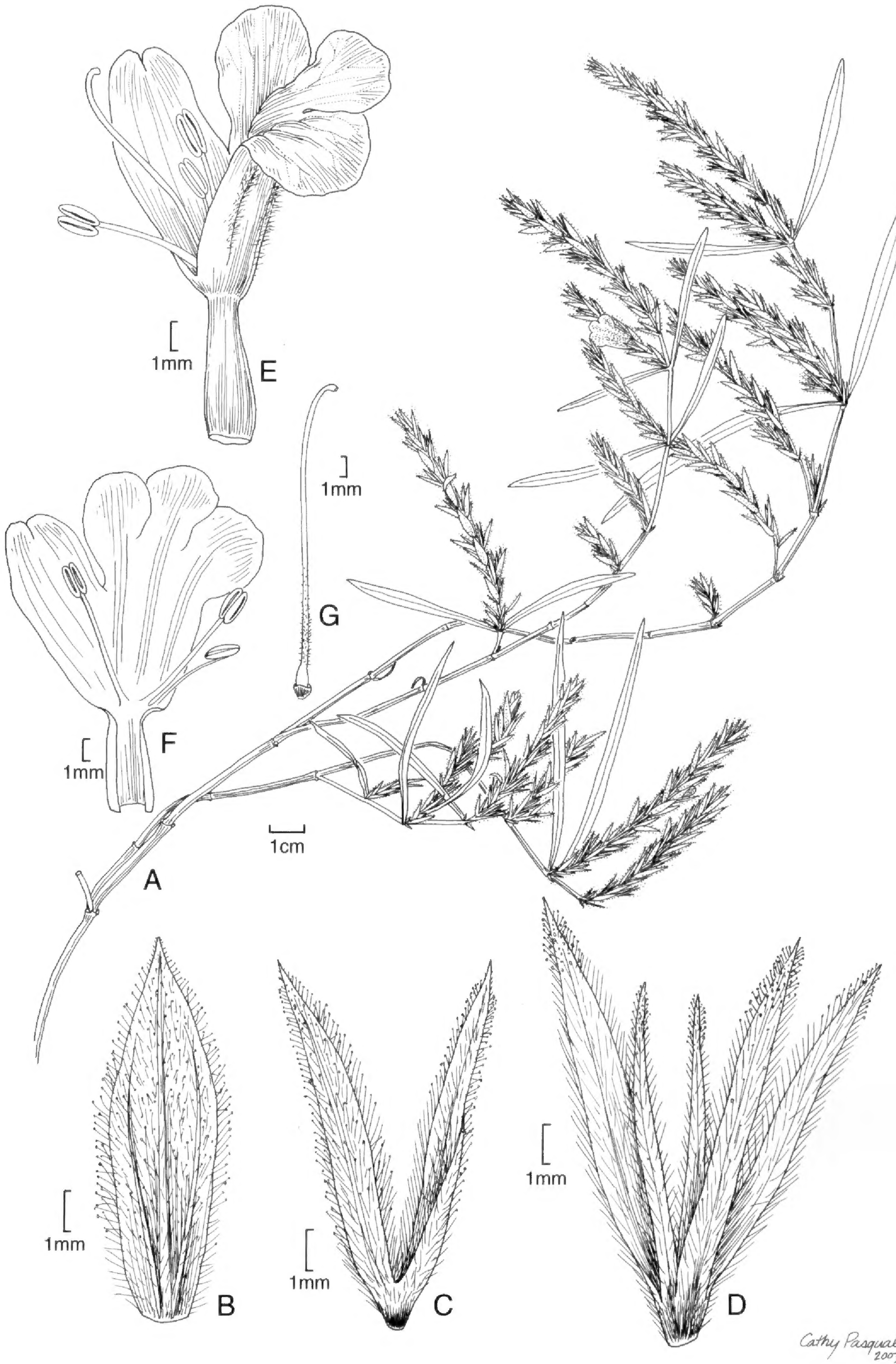


Fig. 1. *Acanthura mattogrossensis*. A. Habit. B. Bract. C. Bracteoles. D. Calyx lobes. E. Corolla, stamens and pistil. F. Corolla expanded. (From *G. Hatschbach et al. 66794*, US).

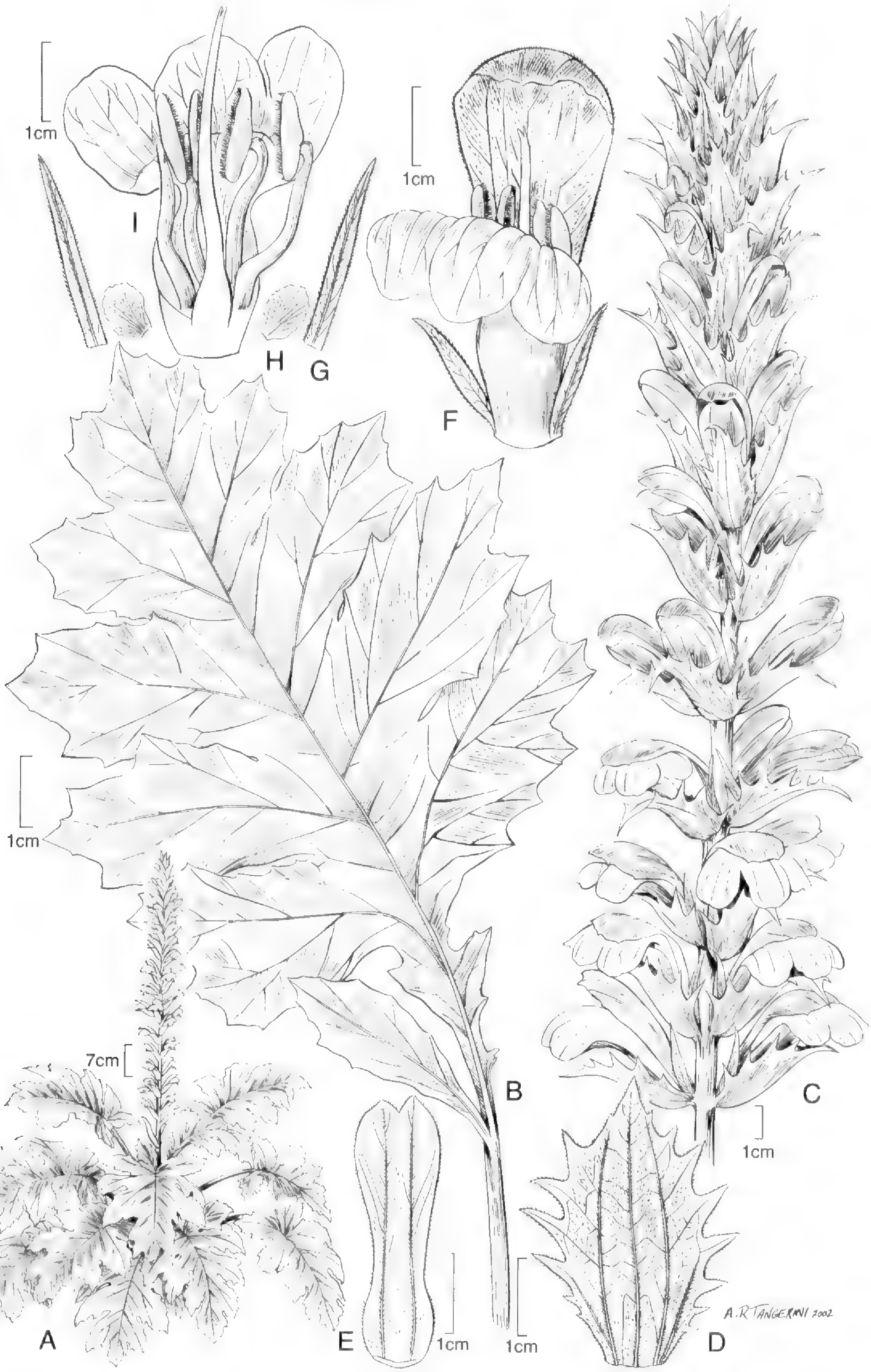


Fig. 2. *Acanthus mollis*. A. Habit. B. Leaf blade. C. Inflorescence. D. Bract. E. Outer calyx lobes. F. Bracteoles and corolla. G. Bracteoles. H. Inner calyx lobes. I. Corolla, lower lip, stamens and pistil. (From *J. Solomon 17299*, MO).

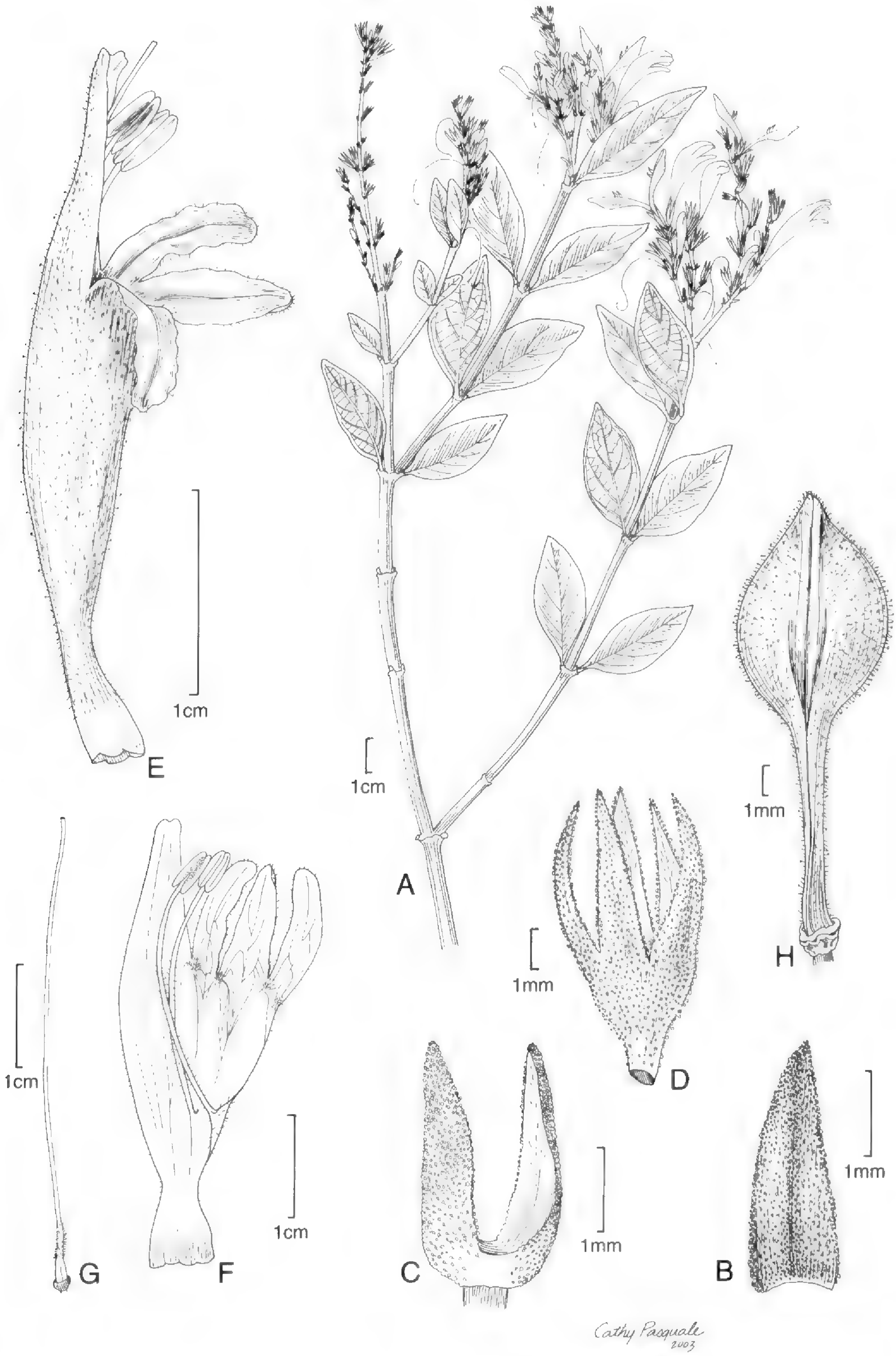


Fig. 3. *Anisacanthus boliviensis*. A. Habit. B. Bract. C. Bracteoles. D. Calyx lobes. E. Corolla, stamens and pistil. F. Corolla expanded. G. Pistil. H. Capsule. (From *D. Wasshausen et al. 2030*, US).

4. **Aphelandra** R. Br.

Perennial suffrutescent herbs or shrubs; stems terete to quadrangular, the nodes frequently swollen; leaves opposite, petiolate, margins often sinuate-serrate with sinuses spinulose-dentate, cystoliths absent; inflorescence of terminal or axillary spikes, these often conspicuous with showy bracts and flowers; bracts imbricate, often colored, margin entire or dentate and spine--tipped; bracteoles 2; calyx 5-lobed, the lobes ± equal in length; corolla bilabiate, pale to bright red, orange or yellow; stamens 4, usually exserted; anthers 1--thecous; capsule clavate to subglobose, 4-seeded.

A neotropical genus of about 190 species occurring from northwestern Mexico southeastward through regions of both wet and dry forests to southeastern Brazil. The greatest concentration of species is found in the Andes of Colombia, Ecuador and Peru; tapering off in Bolivia with 13 species.

Key to the Species of **Aphelandra**

1a. Leaf blade margin entire or undulate 2
1b. Leaf blade margin dentate or serrate or serrate-dentate, indentations or teeth distinctly spine-tipped 5

2a. Spicate bracts dull red to orange, rhombic-ovate, rigid, with paired bracteal nectar patches, these lateral and submedial, margin entire 3
2b. Spicate bracts green, greenish-yellow (sometimes brownish), or reddish along margin, lance-ovate to ovate-elliptic to rhombic-ovate to oblong, not rigid, without paired bracteal nectar patches, margin serrulate or entire to minutely dentate 4

3a. Corolla 35-45 (50) mm long; spike 7-10 mm wide without corollas; capsule 12-14 x 4-5 x 3-5 mm ..... *A. glabrata*
3b. Corolla 60-70 mm long; spike narrow, 3.5-5 mm wide without corollas; capsule 20-22 x 7 x 5 mm ..... *A. macrostachya*

4.a Corolla red to reddish-orange, 50-60 mm long; leaf blade unicolorous, not variegated, the veins green ..... *A. aurantiaca*
4b. Corolla yellow, 20-25 mm long; leaf blade conspicuously variegated, the veins light green to yellowish ..... *A. maculata*

5a. Bracts conspicuous, ovate, colored red or orange red to reddish, sometimes greenish at the apex or the upper portion reddish, the lower portion basally yellowish 6
5b. Bracts not ovate, not conspicuous or colored green or greenish 7

6a. Bracts pubescent, long-acute to acuminate, setiform, the margin bearing on each side 4-6 slender, spinose teeth ..... *A. rusbyi*
6b. Bracts glabrous, acute, the margin minutely dentate bearing on each side 11-13 slender spinose teeth ..... *A. rubra*

7a. Leaf blades conspicuously large, superficially resembling those of *Acanthus spinosus*, margin deeply sinuate-lobed, both lobes and sinuses spinulose-dentate ..... *A. kolobantha*
7b. Leaf blades not conspicuously large, margin not deeply lobed, coarsely serrate, sinuate-serrate or dentate-serrate, all spinulose-dentate except sinuses 8

8a. Flowers borne in lax, terminal and subterminal spikes; bracts scarcely imbricate 9
8b. Flowers borne in dense terminal or on short axillary spikes; bracts distinctly imbricate 10

9a. Terminal spike 7 cm long (without peduncle); bracts lanceolate 18-22 mm long; corolla pink or red, 45-60 mm long ..... *A. castanifolia*

9b. Terminal and axillary spikes 2-3 cm long (without peduncles); bracts triangular-ovate, 5-10 mm long; corolla bright red, 30-35 mm long ..... *A. hieronymi*

10a. Corolla bright creamy-yellow in all specimens, I have seen; bracts ovate, long-acuminate, glabrate ..... *A. inaequalis*

10b. Corolla purple, rose-colored or red; bracts lanceolate, glabrate, puberulent or moderately pilose ..... *A. macrosiphon*

Aphelandra aurantiaca (Scheidw.) Lindl., Bot. Reg. 31, Pl. 12. 1845. – *Hemisandra aurantiaca* Scheidw., Bull. Acad. Sci. Bruxelles 9:22. 1842. TYPE: Neotype (Daniel 1991: 248): Mexico, illustration accompanying Lindley's new combination.
Aphelandra simplex Lindau, Bull. Herb. Boiss., ser. I, 3:366. 1895. TYPE: Bolivia, Cochabamba, *Kuntze s.n.* (lectotype NY, here chosen).

Unbranched perennial herbs to 1.5 m; leaf blades ovate-elliptic to elliptic, glabrous, entire; inflorescence 1-several spikes; bracts green or reddish along margin, lance-ovate to ovate-elliptic, margin dentate; corolla red to reddish-orange, lower lip spreading, 3-lobed, lateral lobes reduced, upper lip erect, minutely bilobed.
Widespread species along streams and on slopes in tropical rain forest, 250-1700 m, from Mexico southward to Bolivia, where it is locally frequent in moist forest in the Andean foothills from the Ichilo region northwards. Flowers at the end of the rainy season from March to July.

Specimens examined: BENI: Ballivián, *Davis 1161* (US), *Beck 6868A* (LPB, US), *16410* (LPB, F), *Solomon 13894* (LPB, MO, US), *Smith 13194, 13240* (LPB, MO, NY). LA PAZ: Iturralde, *Schoppenhorst B508* (LPB, US); Larecaja, Mapiri Region, *Buchtien 1368* (US), *1369, 1370* (NY, US); Nor Yungas, *Seidel 2594* (LPB, US), Caranavi, *Babcock 135, 215* (K), *Wood & Mondaca 14558* (K, LPB, US); Alto Beni, *Badcock 154* (K); Sud Yungas, *Seidel 2661* (LPB); Tumapasa, *White 572* (NY, US), *1826* (K, NY, US). SANTA CRUZ: Ichilo, *Beck 6608* (LPB, US), *Nee 41014* (LPB, NY, US); Pica del Sara, *Steinbach 2750* (US); Río Yapacaní, *Steinbach 7503* (K, MO); *Wood 12209* (LPB, K). COCHABAMBA: *Bang 2054* (NY); Tiraque, *Wood, Wasshausen & Brummitt 2072* (CAS, K, LPB, US). WITHOUT PRECISE LOCALITY: *Pearce 426, 548, 798* (K).

Aphelandra castanifolia Britton ex Rusby, Bull. Torrey Bot. Club 27:76. 1900. TYPE: Bolivia, Yungas, *Rusby 1098* (holotype NY; isotype US-1320084).
Aphelandra peruviana Wassh., Phytologia 25: 470. 1973. TYPE: Peru, Cusco, Paucartambo, *Weberbauer 6952* (holotype F; isotype GH). Fig. 4.

Shrub or treelet 0.5-3 m; leaves oblong-obovate, glabrous, coriaceous, margins coarsely serrate with spinulose teeth; inflorescence 1-several spikes; flowers alternate or subopposite; bracts green, lanceolate, rigid, margin entire; corolla pink, lower lip erect or spreading with age, 3-lobed, lateral lobes reduced, upper lip erect, 2-lobed.

Locally frequent, nearly endemic plant of the wettest cloud forest at around 2000 m with a disjunct distribution in Bolivia closely paralleling that of *Stenostephanus lyman-smithii*.

Specimens examined: LA PAZ: Larecaja: Mapiri Region, *Rusby 1112* (US), Mapiri Region, San Carlos, *Buchtien 1363* (NY, US); Nor Yungas, *Solomon 8067* (LPB, MO, NY, US), *12070, 13988* (LPB, MO, US), *18452* (LPB, MO); Caranavi, *Wasshausen et al. 2108* (CAS, K, LPB, US), *Wood & Daniel 18385* (K, LPB, US); Sud Yungas, *Beck 4733* (LPB, US); Tamayo, *Helme 78* (LPB, US); *Wood & Harley 18144* (LPB, K). COCHABAMBA or SANTA CRUZ: Yungas, San Mateo, *Herzog 1991* (L). SANTA CRUZ: Caballero, *Smith 13447* (LPB, MO); *Wood 11019* (K, LPB); *Wood & Serrano s.n.* (K, LPB).

Aphelandra glabrata Willd. ex Nees, in DC., Prodr. 11:296. 1847. TYPE: Colombia, Cundinamarca, *Humboldt & Bonpland s.n.* (holotype B; F photo 8708).

Shrub or subshrub 0.4-3 m; leaves elliptic to narrowly obovate, glabrous, margin entire; inflorescence 1-several axillary and terminal spikes; bracts dull orange, rhombic-ovate, rigid, with paired bracteal nectar patches lateral and submedial, margin entire; corolla red or deep

Fig. 4. *Aphelandra castanifolia*. A. Habit. B. Bract. C. Bracteoles. D. Calyx lobes. E. Corolla, stamens and pistil. F. Corolla expanded. G. Pistil and ovary. (A, from *J. Solomon 13988*, US; B-G, from *O. Buchtien 1363*, US).

orange-red, papillate, lower lip spreading, 3-lobed, lateral lobes reduced, upper lip erect, minutely bilobed.

Widespread neotropical species found in Bolivia principally in seasonally dry forest in the deep valleys of the Yungas region. Flowers principally from January to June.

Specimens examined: PANDO: Manuripi, *Cardiel 52* (MO). LA PAZ: Tamayo, *Kessler 3854* (LPB, US), *Wasshausen & Wood 2277* (CAS, K, LPB, US); Larecaja, *Beck 3760* (LPB, US); Guanay, *Rusby ll07* (NY, US), *Tate 563* (NY); Guanay-Tipuani, *Bang 1368* (K, MO, NY, US); Sud Yungas, *Krukoff 10010* (K, MO, NY, US), *Beck 1663*, *12136*, *12667*, (LPB, US), *Seidel 2015* (LPB, US); *Vargas & Seidel 2049* (LPB, US); Nor Yungas, *Beck 9313* (LPB, NY).

Aphelandra hieronymi Griseb., Abh. Königl. Ges. Wiss. Göttingen 24:260. 1879. TYPES: Argentina, Salta, *Lorentz & Hieronymus 270* (syntype CORD); Bolivia, Las Salinas, *Lorentz & Hieronymus 918* (syntype B, destroyed, CORD, GH, S; F photo 8663).

Subshrub or weak shrub, 1-2 m; leaves oblong-lanceolate, glabrous, coriaceous, margin sinuate-serrate with spinulose teeth; inflorescence 1-several, axillary and terminal, pedunculate short spikes; bracts foliaceous, green, triangular-ovate, margins spine-tipped; corolla bright red, finely pubescent, arching-erect, lower lip 3-lobed, lobes spreading, lateral lobes reduced in width, upper lip erect, bilobed. Subtropical semi-deciduous forest understory species of Bolivia and northern Argentina.

A characteristic species of moist forested gullies in the Tucuman-Bolivian forest belt from the Comarapa region south to Northern Argentina. Flowers at the end of rains, principally from April to June.

Specimens examined: COCHABAMBA: Campero, *Kessler 4631* (LPB, US). SANTA CRUZ: Florida, *Nee 40703* (LPB, MO, NY, US); Caballero, *Wasshausen, Brummitt & Wood 2034* (K, LPB, US); Cordillera, *Cárdenas 2794* (US); Vallegrande, *Vargas 721* (LPB, MO, NY). CHUQUISACA: Boeto, *Kessler 5146* (LPB, US); Tomina, *Wood 8437* (K, LPB) *8470* (K, LPB), *12295* (K, LPB); Jaime Mendoza, *Kessler 5018* (LPB, US); Siles, *Kessler 4857*, *4971* (LPB, US); Rosal, *Brooke 5743* (BM). TARIJA: O'Connor, Apr 1864, *Pearce s.n.* (K); Entre Rios, *Solomon 10338* (MO, NY, US), *11021* (MO); *Wood 16385* (K, LPB); Arce, *Beck & Liberman 9605* (LPB, NY, US); *Solomon 11259* (MO). WITHOUT PRECISE LOCALITY: St. Louis, Apr 1864, *Pearce s.n.* (K).

Aphelandra inaequalis Lindau, Bull. Herb. Boiss., ser. 1, 3:368. 1895. TYPE: Bolivia, Cochabamba, between Tiraqui & Santa Rosa, *Kuntze s.n.* (holotype B, destroyed; F photo 8665; isotype NY).

Understory shrub 1.5-2.5 m; leaves oblong, sparsely pilose, margins sinuate-serrate with spinulose teeth; inflorescence 1-several, terminal, pedunculate short spikes; bracts ovate, margins dentate-ciliate, glabrous; corolla cream, finely pubescent, lower lip 3-lobed, lobes spreading, lateral lobes reduced in width, upper lip erect, distinctly bilobed.

Specimens examined: SANTA CRUZ: Ichilo, *Saldias 509* (MO, US), *Nee & Saldias 37266* (LPB, NY, US); *Wood 12214* (K, LPB). COCHABAMBA: Carrasco, *Ibisch s.n.* (LPB).

Aphelandra kolobantha Lindau, Annuaire Conserv. Jard. Bot. Genève 2:39. 1898. TYPE: Bolivia, La Paz, Sorata, *Mandon 300* (holotype B, destroyed; F photo 8667; isotypes GH, K, P, US-3290301, W).

Shrub; leaves oblong-lanceolate, glabrous, thin, margins deeply sinuate-lobate, both lobes and sinuses spinulose-dentate; inflorescence solitary, terminal spike; bracts foliaceous, narrowly lanceolate, margin spine-tipped; corolla pale mauve, finely pubescent, limb bilabiate, lips subequal, lower lip 3-lobed, lobes subequal, emarginate, middle lobe 2-parted, upper lip emarginate.

A very rare endemic species of moist scrub-filled gullies in relatively dry Andean valleys, only collected three times. It is an endangered species according to IUCN categories.

Specimens examined: LA PAZ: Inquisivi, *Wood & Ortuno 19370A* (LPB). COCHABAMBA: Ayopaya, *Brooke 6050* (NY).

Aphelandra macrosiphon Lindau, Bull. Herb. Boiss., ser. I, 3:367. 1895. TYPE: Bolivia, Cochabamba, Rio Juntas, *Kuntze s.n.* (holotype B, destroyed; F photo B8673;

isotype NY).

Aphelandra longibracteata Lindau, Bull. Herb. Boiss., ser. I, 3:367. 1895. TYPE: Bolivia, Cochabamba, between Tiraqui & Santa Rosa, *Kuntze s.n.* (holotype B, destroyed; F photo B8670; isotype NY).

Shrub 2-3 m; leaves oblong, pubescent, margins coarsely serrate and spine-tipped; inflorescence several, pedunculate, racemose, terminal spikes; bracts lanceolate, pubescent, margins spinose-dentate; corolla red, puberulent, lower lip 3-lobed, lobes spreading, equal, upper lip erect, minutely bilobed.

A rare endemic species of moist forest on the lower Andean slopes. It flowers towards the end of the rain season and should be classed as vulnerable according to IUCN categories.

Specimens examined: LA PAZ: Tamayo, *Boeke 1476* (NY, US); Saavedra, *Kessler et al. 10006* (KPB, US). COCHABAMBA: Tiraque, *Wood 12424* (K, LPB), *13665* (K, LPB); Carrasco, *Kessler et al. 7618* (LPB, US). WITHOUT PRECISE LOCALITY: Bolivia, *Pearce 733* (K).

Aphelandra macrostachya Nees, in Mart., Fl. Bras. 9:88. 1847. TYPE: Colombia, Amazonas, Rio Negro, *Martius 3179* (holotype M; F photo 20496).

Shrub 2 m; leaves large, elliptic to narrowly obovate, glabrous, margins entire; inflorescence of 1-several, terminal and axillary, elongate spikes; bracts red-orange, rhombic-ovate, rigid, with paired bracteal nectar patches lateral and submedial, margin entire; corolla red-orange, papillate, lower lip spreading, 3-lobed, lateral lobes reduced, upper lip erect, minutely bilobed.

A species of Amazonian forest.

Specimens examined: PANDO: Nicolas Suárez, *Gonzales 1* (LPB, US), *Sperling & King 6435* (K, LPB, MO, NY, US); Manuripi, *Beck 19405* (LBP), *Groves-Raines 160* (MO).

Aphelandra maculata (Tafalla ex Nees) Voss, Vilmorin's Blumengart. ed. 3,1:819. 1894. - *Lagochilium maculatum* Tafella ex Nees, in DC. Prodr. 11:290. 1847. TYPE: Ecuador, Guayaquil, Caniguo, *Hall 34* (holotype K).

Stenandrium igneum (Linden) André, Ill. Hort. 24:10, pl. 266. 1877, nom. illeg., non *Stenandrium igneum* Nees, 1847. - *Eranthemum igneum* Linden, Fl. des Serres, ser. II. 7. t. 1722. 1867-68. TYPE: Sent to M. Linden, Peru, Rio Huallaga, not found. Typification is on basis of description and plate, especially the latter.

Stenandrium lindeni N. E. Br., Ill. Hort. 38:91, pl. 136. 1891. TYPE: a cultivated plant from L'Horticulture Internationale of Peruvian origin (holotype K).

Herb 10-60 cm; leaves elliptic to oblong, glabrous, conspicuously variegated, the veins light green to yellowish, margin entire; inflorescence of 1-several spikes; bracts narrowly rhombic-ovate to oblong, greenish-yellow (sometimes brownish), margin serrulate; corolla yellow, glabrous, lower lip 3-lobed, lobes subequal, lateral somewhat reduced in width, upper lip erect, 2-lobed.

Only known from old collections from one area in Bolivia and possibly now extinct there.

Specimens examined: LA PAZ: Ixiamas-Tumupasa trail, *Williams 298* (NY), Tumapasa, *Cárdenas 1954* (NY).

Aphelandra rubra Wassh., Phytologia 25:494. 1973. TYPE: Bolivia, La Paz, Sud Yungas, *Krukoff 10146* (holotype US-1831853; isotypes K, MO, NY).

Shrub 1-2 m; leaves oblong-obovate, puberulous, margins weakly serrate; petioles spinose; inflorescence of 1-several, terminal, quadrangular spikes; flowers alternate or subopposite; bracts dark red-orange with green apex, ovate, rigid, margin spiny-toothed; corolla yellow, when immature lips erect, apically pubescent.

Endemic to Bolivia in moist forest in the Andean foothills of La Paz Department, 270-900 m.

Specimens examined: BENI: Ballivián, *Beck 6869* (LPB, US), *Beck et al. 16414* (LPB, US), *Cutler 9071* (F), *Davis 1067* (US), *Smith 13178, 13208* (LPB, MO, NY), *Solomon 13892* (MO, NY, US), *Daly 6491* (LPB, NY); Yucumo, Río Maniqui, *Fournet 467* (US). LA PAZ: Iturralde, *Beck & Foster 24075* (F, LPB); *Stab B49* (LPB, US), *De Walt 392* (LPB); Caranavi, Upper Rio Beni, *Evans 96* (BM); Sud Yungas, Bopi River

Valley, *Rusby 579* (NY); *Beck 8505* (LPB, NY, US), *Williams 646* (BM, K, NY), *Vargas 2108* (LPB), *Schmit 51* (LPB). WITHOUT PRECISE LOCALITY: Valley below Chaella, May 1866, *Pearce s.n.* (K).

Aphelandra rusbyi Britton ex Rusby, Bull. Torrey Bot. Club 27:77. 1900. TYPE: Bolivia, Beni, Yacuma, Reis, *Rusby 1108* (holotype NY; isotypes BM, K, MO, P, US-1320130).

Aphelandra cryptantha Rusby, Mem. N.Y. Bot. Gard. 7:364. 1927. TYPE: Bolivia, La Paz, Sud Yungas, Huachi, *White 542* (holotype NY; isotypes K, US-1232211).

Shrublet 0.4-2 m; leaves obovate to oblanceolate, glabrous to moderately pilose, margin coarsely serrate and spinose-dentate; inflorescence 1-several, terminal, pedunculate, reddish spikes; bracts orange to reddish, basally ovate, pubescent, margin setiform and spine-tipped; corolla inconspicuous, yellow with reddish pubescent lobes, immature lips erect.

Endemic species of deciduous subtropical dry forest with a disjunct distribution in the Andean foothills and an outlying station in the Chiquitania, 250-750 m.

Specimens examined: BENI: Yacuma, *Fleischmann 313* (S); Ballivián, *Beck 8248* (LPB), *16624* (LPB, US), *de Michel 1054* (LPB). COCHABAMBA: Carrasco, *Wood 14922* (K, LPB). SANTA CRUZ: Ichilo, *J. Steinbach 7157* (K, MO, NY, S), *Wood 14973* (K, LPB, US); Ibáñez, *Nee 40533* (LPB, NY, US), *Saldias 9* (NY), *Mostacedo 500* (LPB, USZ); Florida, Angostura, *R. Steinbach 338* (LPB, MO, NY, US); Ñuflo de Chávez, *Lewis s.n.* (NY); *Kuntze s.n.* (NY); *Wood 12553* (K, LPB, US); Vallegrande, *Kessler 5305* (LPB, US); Cuesta de Guitarraz, *Herzog 1695* (L).

5. **Asystasia** Blume

Asystasia gangetica (L.) T. Anderson, in Thwaites, Enum. Pl. Zeyl. 235. 1860. - *Justicia gangetica* L., Centuria 2:3. 1756. TYPE: India, *Anon. s.n.* (LINN).

Asystasia coromandeliana Nees, in Wallich, Pl. Asiatic. Rar. 3:89. 1832. *nom. illeg.* Fig. 5.

Perennial shrub or subshrub to 1.5 m, procumbent or clambering; branches ± quadrangular, sometimes furrowed on both sides, often constricted above nodes, these pubescent, glabrate or pubescent with trichomes disposed in decussating lines; leaves petiolate, opposite pair connected by a transverse ridge; blades ovate, 15-45 (90) x 5-30 (50) mm, apex abruptly acuminate, truncate at base, glabrous or minutely pubescent above, minutely and sparingly pubescent below, margin ± entire to shallowly erose; leaves subtending peduncles reduced, narrower than cauline leaves; inflorescence an axillary or terminal, often 1-sided raceme 4-10 (20) cm long; peduncles to 5.5 cm long; bracts in opposite pairs on either side of peduncle, triangular, 0.8 x 0.75-1.5 mm, pubescent; bracteoles similar to bracts but smaller; flowers borne singly at nodes; pedicels 0.5-1.5 mm long; calyx 5-lobed, 5-10 mm long, glabrous or pubescent without; corolla more or less regular, yellow with purplish throat, infundibuliform, inconspicuously puberulous without, tube and throat funnelform, 15-20 mm long, tube half as long as ampliate throat, this 13 mm wide, limb 5-lobed, lobes 8.5 x 1.5 mm in diam., rounded, conspicuously and coarsely reticulate veined; stamens 4, ± equal, inserted in pairs in widened part of corolla tube; anthers 2-thecous, theca parallel, sparsely eglandular and glandular pubescent dorsally; ovary pubescent; capsule stipitate, pubescent, 20-25 mm long, retinacula 2 in each valve, often 1 and its seeds not fully developed; seeds 2 or 4, 4 x 4 mm, smooth on sides.

Native to tropical Africa and Asia; introduced into tropical America where it is cultivated or persists as an escape.

Specimens examined: COCHABAMBA: Chaparé, Villa Tunari. SANTA CRUZ: Chiquitos, Santiago de Chiquitos.

6. **Blechum** P. Browne

Blechum pyramidatum (Lam.) Urb., Repert. Spec. Nov. Regni Veg. 15: 323. 1918. - *Barleria pyramidata* Lam., Encycl. 1:380. 1785. TYPE: Santo Domingo, an illustration of Plumier (Pl. Amer. 2:t. 42, Fig. 3. 1756), typification is based on illustration.

Ruellia blechum L., Syst. Nat. ed. 10, 2:1120. 1759. - *Blechum brownei* Juss., Ann. Mus. Natl. Hist. Nat. 9: 270. 1807. - *Blechum blechum* (L.) Millsp., Publ. Field Columbian

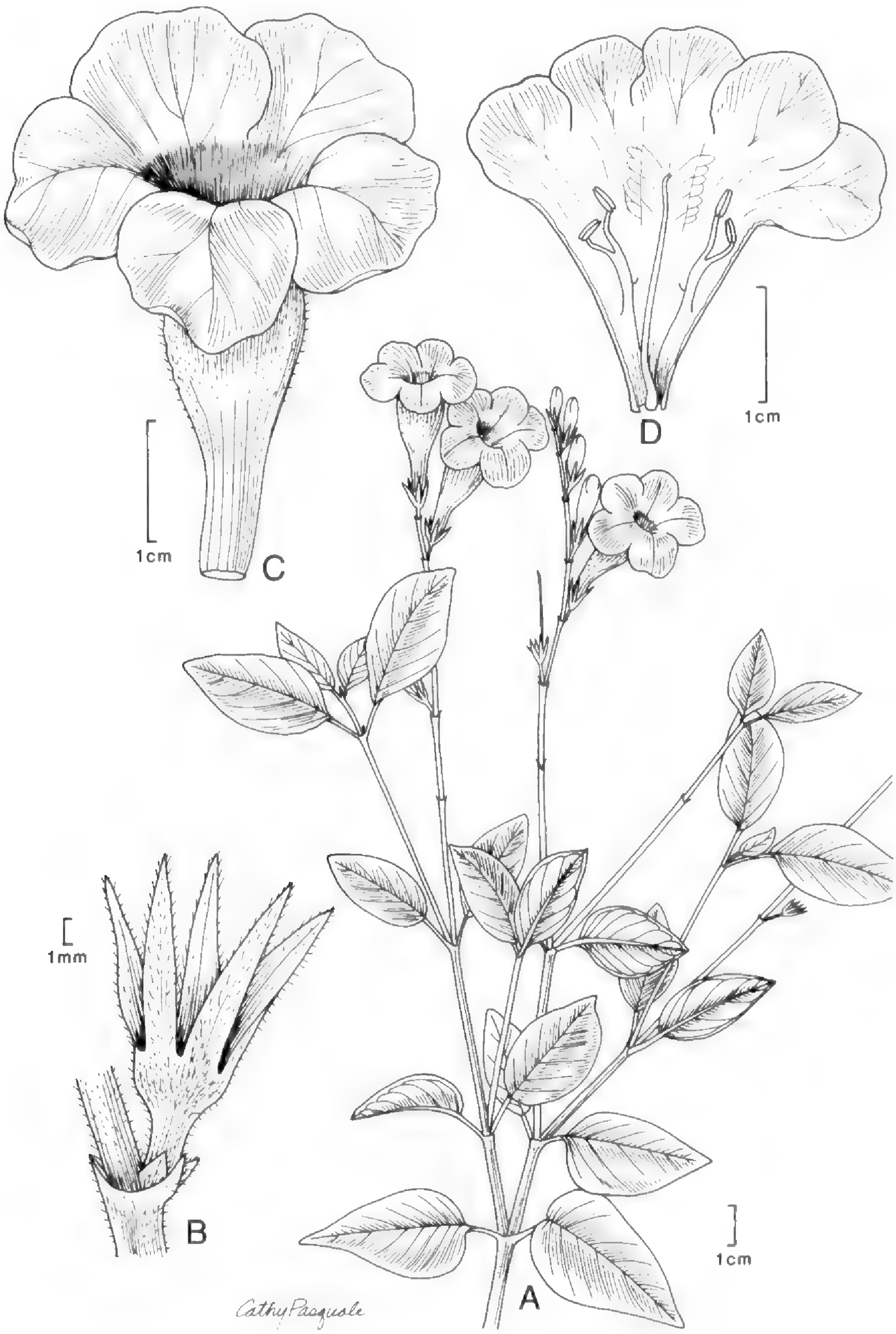


Fig. 5. *Asystasia gangetica*. A. Habit. B. Bract, bracteoles and calyx lobes. C. Corolla. D. Corolla expanded. (A, from *R. Fosberg 59919*, US; B-D, from *D. Herbst & Falanruw 6920*, US).

Mus., Bot. Ser. 2: 100. 1900, nom illeg. TYPE: illustrations of Sloane (Voy. Jamaica l:t. 109, fig. 1. 1707) and Plumier (Pl. Amer. 2:t. 42, fig. 3. 1756) were cited.

Blechum brownei Juss. fo. *puberulum* Leonard, J. Wash. Acad. Sci. 32:184. 1942. TYPE: Haiti, Jean Rabel, *Leonard 12696* (holotype US-1451437). Fig. 6.

Sprawling or erect perennial herb 35-70 cm; leaves lanceolate to ovate, thin; inflorescence terminal or axillary, quadrangular, densely spicate, flowers in axils of foliaceous bracts; bracts green, imbricate, ovate to suborbicular, ciliate; corolla white to pale lavender, extending well beyond subtending bracts, limb nearly equally 5-lobed; stamens 4; anthers 2-locular; capsule 16-seeded.

Widely distributed (*e.g.* along roadsides) in open waste places or cultivated places in either dry or moist habitats but rare in Bolivia. This weedy species has also become naturalized in the Paleotropics

Specimens examined: BENI: Vaca Díez, *Solomon 6271* (MO, NY, US); Marban, *Beck 2688* (LPB, NY, US); Cercado, *Solomon 8125* (LPB, MO). COCHABAMBA: Nuflo de Chavez, *Wood 10047* (K, LPB)

7. **Dicliptera** Juss.

Annual or perennial herbs, sometimes woody below, occasionally shrubby and scrambling, with cystoliths; stems obscurely hexagonal; inflorescence of small bracteate cymes in axils of upper leaves forming loose, terminal spikes or panicles; corolla strongly bilabiate, usually resupinate, pink, red, orange or white; stamens 2; anthers 2-thecous; capsule 4-seeded, the placenta rising from base as fruit ripens. Between 80 and 150 species of *Dicliptera* are distributed in the tropical and subtropical regions of the world. Although readily recognized by its hexagonal stems and the flattened, bracted cymes, the genus presents difficulties at the specific level.

Key to the Species of **Dicliptera**

1a. Inflorescence of naked spikes forming a panicle of spikes; bracts minute, oblanceolate, < 5 mm long ..... *D. sexangularis*
1b. Inflorescence varied but if paniculate, leafy; bracts usually > 8 mm long, not oblanceolate 2

2a. Cymule bracts ovate, elliptic or obovate, scarcely broader than long, not leaf-like; corolla deep pink 3
2b. Cymule bracts linear to linear-(ob-)lanceolate, sometimes with a leaf-like apex, always much broader than long; corolla red, orange or yellow 4

3a. Cymule bracts ovate, 6-15 mm wide; leaves pubescent below ..... *D. scutellata*
3b. Cymule bracts elliptic to obovate, 3-6 mm wide; leaves almost glabrous below ..... *D. cochabambensis*

4a. Cymule bracts usually leafy at the apex; flowers usually in dense, sessile clusters or heads in the axils ..... *D. squarrosa*
4b. Cymule bracts not leafy at the apex; flowers in pedunculate, axillary cymes, often forming a leafy panicle .. 5

5a. Cymule bracts narrowly linear-elliptic, broadest in the middle; leaves softly pubescent above ..... *D. palmariensis*
5b. Cymule bracts linear-lanceolate, broadest at the base; leaves soon glabrescent above 6

6a. Inflorescence branches leafless, usually short; bracts linear-oblong, acute; corolla lobes almost half as long as the tube ..... *D. jujuyensis*
6b. Inflorescence branches often with subtending leaves, often well-developed; bracts lanceolate, finely acuminate; corolla lobes much shorter than the tube ..... *D. purpurascens*

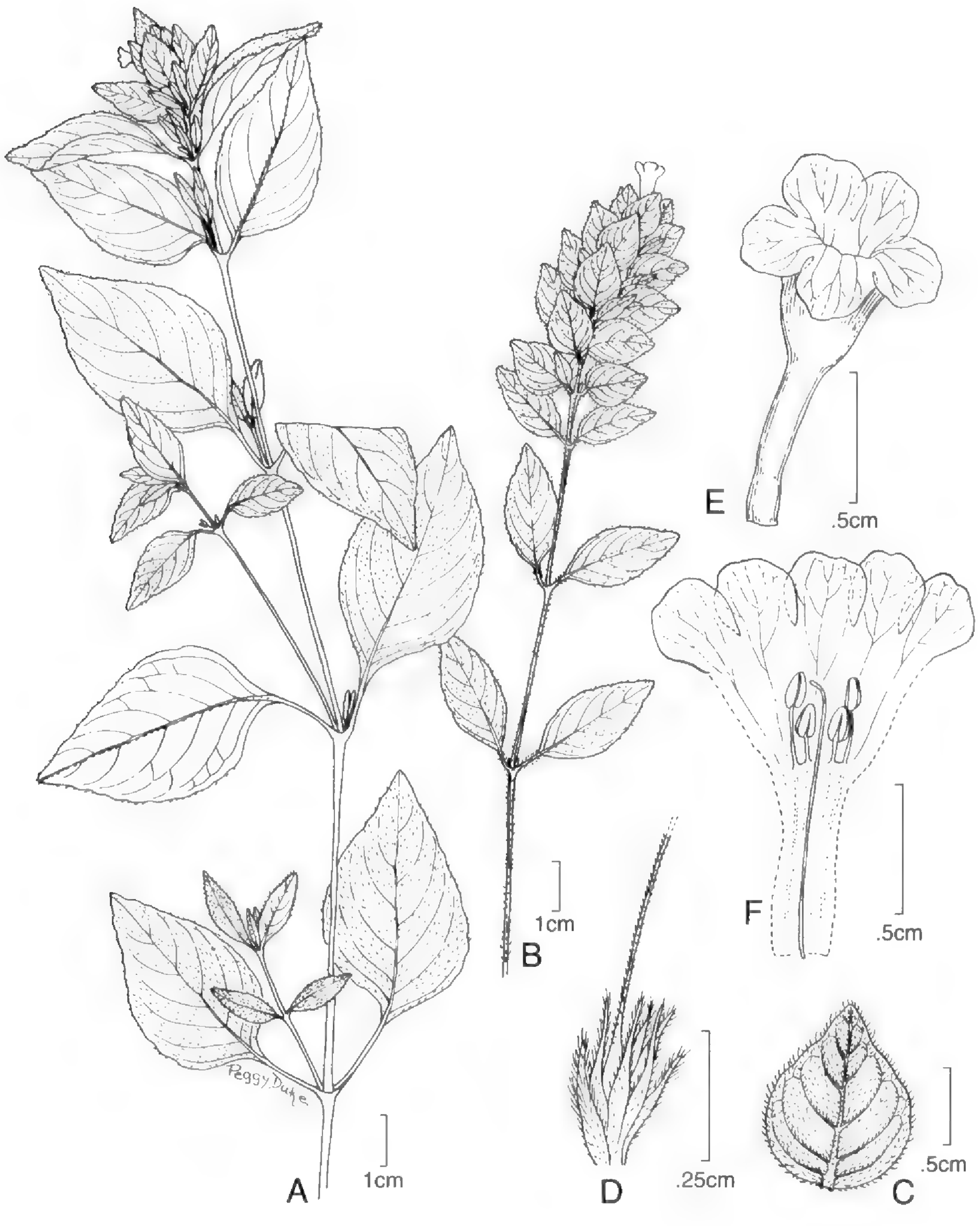


Fig. 6. *Blechum pyramidatum*. A. Habit. B. Inflorescence. C. Bract. D. Bracteoles and calyx lobes. E. Corolla. F. Corolla expanded. (A, from *S. Mori 18781*, US; B-F, from *Merlier GY254*, P).

Dicliptera cochabambensis Lindau, Bull. Herb. Boiss., ser. I, 3:479. 1895. TYPE: Bolivia, Cochabamba, *Kuntze s.n.* (holotype B, destroyed; isotype US-701873).

Diapedium multicaule Rusby, Mem. Torrey Bot. Club 6:105. 1896. TYPE: Bolivia, Cochabamba, *Bang 1001* (holotype NY; isotypes BM, K, MO, US-1320289).

Erect perennial herb, 20-50 cm, entirely glabrous or nearly so; leaves dark green, lanceolate to ovate; bracts obovate or elliptic, 5-8 x 4-6 mm, acute; corolla pink, 10-15 mm long, resupinate.

Endemic to Bolivia but locally abundant in dry bushland in the central valleys, notably in and around the towns of Cochabamba, Sucre and Tarija, 1400-2800 m. Flowers at the end of the rains from around March to May.

Specimens examined: COCHABAMBA: Campero, *R. Steinbach 657* (LPB, MO, NY, US), *Kessler 4602* (LPB, US); Río Tapacari, *Kuntze s.n.* (NY, US); Parotani, *Kuntze s.n.* (NY); Carrasco, *Wood 13642* (K, LPB, US). SANTA CRUZ: Florida, *Kessler 5454* (LPB, US); Caballero, *Wood 13622, 13623* (K, LPB, US). CHUQUISACA: Oropeza, *Cardenas 629* (BOLV, NY), *Wood 12137* (K, LPB, US); Yamparáez, *Kessler 4737* (LPB, US). TARIJA: O'Connor, *Wood 13390* (K, LPB, US); Cercado, *Fiebrig 2833* (BM, K, US), *Krapovickas 18822* (US), *Liberman 2224* (LPB, US), *Bastión 786* (LPB, US); Aviles, *Bastion 1323* (US); Arce, *Liberman 1931* (LPB, US). WITHOUT EXACT LOCALITY: *Mandon 296* pro parte (G, K, NY).

Dicliptera jujuyensis Lindau, Ark. Bot. 1:398. 1903. TYPE: Argentina, *Fries 61* (F-008750).

Very similar to and perhaps conspecific with the previous species, *D. cochabambensis*, from which it differs in its annual habit and long-pedunculate cymes. It also differs by its linear-oblong cymule bracts which are about 5 x as long as broad. The corolla is much larger, ca. 25 mm long and there are only 1-3 cymules on each peduncle so that the whole inflorescence appears few-flowered.

A plant of scattered localities along the western and northern chaco fringes from around 600 m to 2600 m. Flowers at the end of the rainy season from about April to June.

Specimens examined: SANTA CRUZ: Chiquitos, Serrania de Sunsas, *Jardin & Cadden 2165* (UCZ, US); Cordillera, Alto Parapeti, *Michel et al. 462* (LPB, US); Rio Grande crossing on road to Boyuibe, *Kessler et al. 5289* (LPB, US); Cabellero, San Isidro, *Solomon & Nee 17976* (MO, NY, US). CHUQUISACA: Oropeza, Yotala to Puente Mendez, *Wood 10823* (K, LPB, US); *12137* (K, LPB). TARIJA: O'Connor, Entre Rios, *Wood 13390* (K, LPB, US).

Dicliptera palmariensis Wassh. & J. R. I. Wood, sp. nov. Fig. 7. TYPE: Bolivia, Tiraque, 1-2 km above El Palmar along old road from Chaparé to Cochabmaba, *J. R. I. Wood 12403* (holotype K; isotypes LPB, US-3442768).

Quoad formam bractearum cymulorum Diclipteram garcia Leonard *tangit, ob folia pilis lanatis induta, bracteas acutas, non apiculatas ab ea removendum.*

Ascending or weakly erect, much-branched perennial herb to 0.75 m; stems dark purplish-green, densely pilose; leaves petiolate, blades ovate or elliptic, pilose with large-celled trichomes; inflorescence of pedunculate cymes in axils of upper leaves, cymes few-flowered, inflorescence thus rather lax and open; cymules pedicellate; cymule bracts slightly unequal, narrowly oblong-elliptic; inner bracts lanceolate, ciliate on upper margins; bracteoles lanceolate; calyx 5-lobed, the lobes equal; corolla red, 25-28 mm long, cylindrical from a slightly bulbous base, pilose without, 2-lipped; anthers equalling the corolla; anther thecae at different heights; capsule obovoid, 6 mm long, pubescent, 2-seeded.

A rare endemic species restricted to tropical forest in the El Palmar area near Villa Tunari. It is probably threatened within the IUCN categorization even though growing within a protected area.

Specimens examined: COCHABAMBA: Tiraque, *Wood 13674* (K, LPB, US); El Palmar, *Kessler et al. 8115* (GOET, LPB, US).

Dicliptera purpurascens Wassh. & J. R. I. Wood, sp nov. Fig. 8. TYPE: Bolivia, Carrasco, ca. 5 km E of Valle de Sajta on main road from Chimoré to Santa Cruz, 240 m, 29 May 1996, *Wasshausen, Brummitt, Wood & Ritter 2067* (holotype US; isotypes K, LPB).

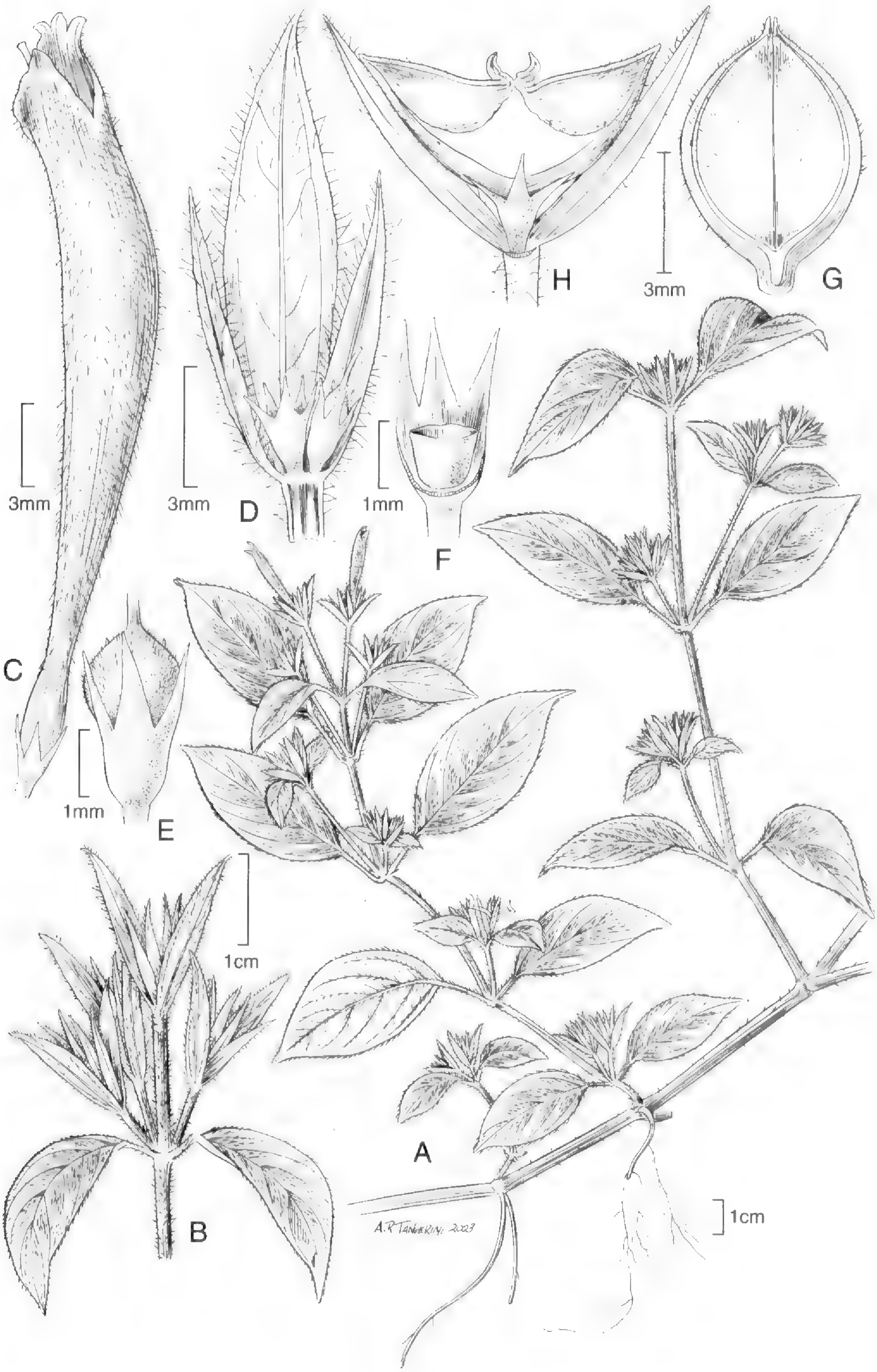


Fig. 7. *Dicliptera palmariensis*. A. Habit. B. Pedunculate cymes. C. Calyx and corolla. D. Inner bract, bracteoles, calyx and aborted flower. E. Calyx and pistil. F. Calyx lobes and nectar disk. G. Capsule. H. Capsule dehisced. (From *J.R.I. Wood 12403*, US).

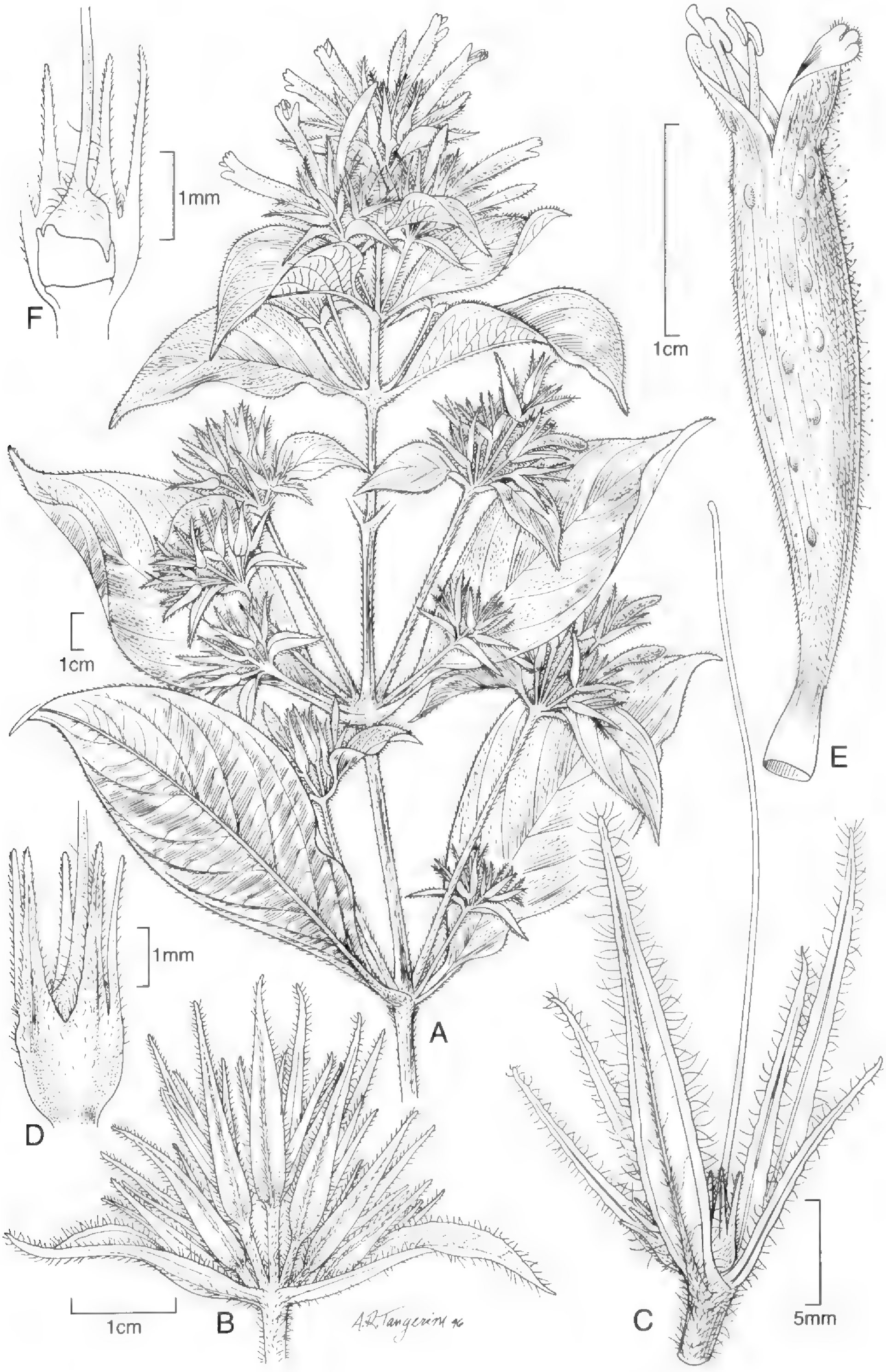


Fig. 8. *Dicliptera purpurascens*. A. Habit. B. Pedunculate cymes. C. Inner bracts, bracteoles, calyx and pistil. D. Calyx and pistil. E. Corolla. F. Nectar disk, pistil and calyx lobes. (From *D. Wasshausen 2067*, US).

Species nova plerumque purpurascens bracteis longis (usque 2.5 mm) lanceolatis, long-acuminatis bene distincta.

Annual or short-lived perennial herb, 0.5-2.5 m high, usually in erect situations but commonly ascending or even decumbent in moister, shady habitats; stems usually purplish, scurfy-pubescent, much branched; leaves petiolate, blades equal or nearly so, ovate to ovate-elliptic, often purplish, darker green above than below, glabrous; inflorescence of shortly pedunculate or subsessile, axillary and terminal cymes, these becoming very dense on old plants with 1-3 cymes arising from each axil, commonly purplish and glandular-pilose but sometimes greenish and very thinly pilose; cymules pedicellate; cymule bracts slightly unequal, lanceolate; inner bracts linear-acuminate; bracteoles similar but shorter; calyx lobes subulate; corolla orange-red 34-40 mm long, cylindrical from a slightly bulbous base, sparsely pilose without, 2-lipped; anthers equaling the corolla; anther thecae at different heights, glabrous; capsule obovoid, 7 mm long, pubescent, 2-seeded.

Locally frequent in moist lowland rain forest between 200 and 600 m in Bolivia and Peru. Obviously related to *D. palmariensis*; the two species are immediately distinguished by the different bracts.

Specimens examined: PANDO: Abuná, *Beck et al. 19283* (LPB, US), *Gentry et al. 77583* (MO, US). COCHABAMBA: Carrasco, *Hensen 6* (BOL, US); km 228, Santa Cruz road, *Sigle 510* (US); Valle de Sajta, *Vargas 673* (LPB, MO, NY, USZ); ca. 235 km NW of Santa Cruz, *Wood 10072* (K, LPB, US); 0.5 KM E of Valle de Sajta, *Wood 11178* (K, LPB); 12 de Julio, ca. 9 km S of Israel *Wood 14893* (K, LPB, US); Zona del Arroyo de 6 de Agosts, Cerro de la Concordia, *Wood 14935* (K, LPB); Ichilo, *Wood 14941* (K, LPB, US).

Dicliptera scutellata Griseb., Abh. Königl. Ges. Wiss. Göttingen 19:178. 1876. - *Diapedium scutellatum* (Griseb.) O. Kuntze, Rev. Gen. Pl. 3(2):248. 1898. TYPE: Argentina, Catamarca, *Lorentz 683* (holotype GOET; isotype CORD).

Perennial puberulent herb; leaves lanceolate or elliptic, 3-7 x 1.5-3 cm; bracts ovate or elliptic, 13-18 x 6-16 mm; corolla ca. 30 mm long.

A species with a disjunct distribution in Argentina and Bolivia, where it is restricted to the dry valley systems of Ayopaya, Inquisivi and Sud Yungas. It flowers at the end of the rainy season from March to June.

Specimens examined: LA PAZ: Inquisivi, *Kessler 5496* (LPB, US). COCHABAMBA: Chapare, Villa Tunari, *Kuntze s.n.* (NY, US); Ayopaya, *Wood 15979* (K, LPB, US); *Wood & Zarate 16211* (K, LPB, US).

Dicliptera sexangularis (L.) Juss., Ann. Mus. Natl. Hist. Nat. 9:269. 1807. - *Justicia sexangularis* L., Sp. Pl. 1:16. 1753. TYPE: Veracruz and Jamaica, Linnaeus cited phrase names from Anm. herb. 274, Hort. Cliff. 10, and Pluk. Alm 142. t. 279. (syntypes BM).
Justicia assurgens L., Syst. Nat. ed. 10, 2:850. 1759. – *Dicliptera assurgens* (L.) Juss., Ann. Mus. Natl. Hist. Nat. 2:269. 1807. TYPE: Brown Jam. t. 2f. 1".

Perennial to 1 m tall, pubescent; leaves ovate, 1-10 x 0.5-5 cm; inflorescence a leafy panicle formed of numerous slender spikes; bracts linear to narrowly elliptic, 2-3.5 x 0.5-1 mm; corolla red, 25-30 mm long, not resupinate.

A widespread neotropical species occurring in lowland bushy places but rare in Bolivia where it reaches in southmost limits.

Specimens examined: BENI: Trinidad, *Werdermann 2350* (K, MO).

Dicliptera squarrosa Nees, in Mart. Fl. Bras. 9:161. 1847. TYPE: Brazil, Minas Gerais, *Reidel 34* (lectotype, here chosen, GZU; isolectotype NY).
Dicliptera sericea Nees, in Mart. Fl. Bras. 9:161. 1847. TYPE: Brazil, São Paulo, Sorocoba, *Riedel & Lund 1984* (lectotype LE, here chosen; isolectotype NY).
Dicliptera pohliana Nees, in Mart. Fl. Bras. 9:162. 1847. TYPE: Brazil, Minas Gerais, Tazenda de Roma, *Pohl 2973* (lectotype, W, here chosen).
Dicliptera tweediana Nees, in DC., Prodr. 11:482. 1847. TYPE: Uruguay, Porto Alegre, *Sellow 13* (585), *16* (d531) (syntypes B, destroyed)
Dicliptera niederleiniana Lindau, Bot. Jahr. 19 Beibl. 48:18. 1894. TYPE: Argentina, Entre

Rios, Primer Misionero de Hernandez, *Puck & Fernandez 42* (holotype B, destroyed).

Dicliptera imminuta Rizzini, Arquiv. Jard. Bot. Rio de Janeiro, 8:348. 1948. TYPE: Brazil, Santa Catarina, *Reitz C861* (holotype RB).

Dicliptera rauhii Wassh., Beitr. Biol. Pflanzen 63:425. 1988. TYPE: Peru, Cuzco, prov. Urubamba, Machu Picchu, *Rauh & Hirsch P804* (holotype HEID).

Variably pubescent perennial, sometimes erect, to 2 m, sometimes decumbent (especially in open, grazed habitats); leaves ovate or elliptic; inflorescence of terminal, leafy spikes with flowers in clusters in upper leaf axils; bracts oblong or oblanceolate, 6-12 x 1-3 mm; corolla orange-red, 18-23 mm long, not resupinate. In moist gullies in disturbed, usually seasonally dry forest and, less commonly, in rough, disturbed grassland, 200-2400 m.

Dicliptera squarrosa is an exceptionally widespread species extending from Brazil south of the Amazon region westward to the eastern slopes of the Andes in Bolivia and Peru and then southward to Uruguay and northern Argentina. Its occurrence further north is uncertain though we feel that *Dicliptera rauhii* Wassh. from Peru belongs to this species and probably also several species described by Leonard from Colombia. *D. squarrosa* is very variable with a welter of different forms throughout its range all intergrading with each other and forming no discrete units except perhaps at a very local level. Presently we can make out the following 6 rather imprecise geographical forms, 5 of which occur in Bolivia. They flower throughout the winter season from about March to September.

Form 1. Plants from Argentina, Uruguay and Paraguay corresponding to the types of *D. tweediana* and *D. pohliana* have glabrous, narrowly lanceolate, obtuse leaves and relatively few-flowered axillary cymes, which become congested above into a terminal thyrse. This form does not occur in Bolivia but some Argentinian plants, especially from the Tucuman region have broader leaves which approach form 4 (below) found in Bolivia although the leaves always appear to be glabrous.

Form 2. Fig. 9. Some populations in the Río Unduavi Valley along the road from La Paz to Sud Yungas appear very distinct. These plants have subglabrous leaves and a relatively long inflorescence of axillary cymes forming many distinct pseudoverticels, which are not confluent above. The corollas are yellow and the cymule bracts are oblong, grey-pubescent and ciliate-margined with distinct squarrose tips.

Specimens examined: LA PAZ: Saavedra, Cerro Asunta Pato, *Wasshausen & Wood 2303* (K, LPB, US; Nor Yungas, Río Unduavi Valley, *Wood 8596, 9952, 13716* (K, LPB, US); Sud Yungas road to Puente Villa, *Wasshausen & Brummmit 2123* (CAS, GOET, K, LPB, US).

However a suite of forms similar to form 2 but with reddish-orange corollas and bracts with few or no cilia occurs elsewhere in the La Paz region and also in Peru. All these forms are difficult to distinguish from *Dicliptera scandens* Leonard from Colombia except that these bear no field notes to suggest that they are scandent. Even *D. scandens* itself is not always scandent.

Specimens examined: LA PAZ: Tamayo, descent into Río Yuyo, *Wood & Wendelberger 16438* (K, LPB, US); Murillo, Zongo Valley, *Solomon et al. 19068* (LPB, MO, US), *Wood 12349* (K, LPB, US); Sud Yungas, Huancané road to San Isidro, *Wood 9964* (K, LPB, US); E of Puente Villa, *Wasshausen & Brummitt 2124* (K, LPB, US), *2126* (CAS, GOET, K, LPB, US); Chulimani, *Beck 22254* (LPB, US); Inquisivi, *Lewis 39127, 39133* (LPB, MO, US). COCHABAMBA: Ayopaya, Independencia, *Wood & Zaraté 16339* (K, LPB, US), *Kessler 12364* (LPB, US).

Form 3. In the northern Bolivian Andes, mostly at lower altitudes and particularly in areas of high rainfall, there is another form. This also has glabrous leaves but the bracts are relatively broad, leaf-like and mucronate, usually elliptic or obovate, never ciliate or squarrose but commonly pubescent to subglabrous. The axillary cymes are relatively few-flowered.

Specimens examined: PANDO: Riberão, *Prance et al. 6539* (K, NY, US). BENI: Ballivián, *Guareco 102* (US); S of Rurrenabaque, *Wasshausen & Wood 2162* (CAS, K, LPB, US); 12 km from Yucuma to Rurrenabaque, *Kessler et al. 10680, 10860* (LPB, US). LA PAZ: Tamayo, *Kessler 4036* (LPB US); Caranavi, above Caranavi, *Wasshausen et al. 2118* (CAS, GOET, K, LPB, US); Sud Yungas, Santa Ana de Alto Beni, *Holliday 26* (K); along road to La Asunta, *Acevedo et al. 4451* (K, US); ascent to Huancané, *Wood 8616* (K, LPB, US; Puente Villa along Río Unduavi, *Wasshausen & Brummitt 2130* (K, LPB, US); above Puente Villa market, *Wood 13709* (K, LPB, US); Sapecho, *Seidel &*

Fig. 9. *Dicliptera squarrosa Form 2.* A. Habit. B. Inflorescence. C. Cymes. D. Corolla. E. Inner bract, bracteoles and pistil. F. Inner bract, bracteoles, calyx lobes and pistil. G. Nectar disk, pistil and calyx lobes. (From *D. Wasshausen 2133*, US).

Vaquiata 7628 (LPB, US). Cochabamba: Chaparé, 15 km W of Villa Tunari, *Wood 8528* (K, LPB); Carrrasco, 6 km W from main road at Bulo Bulo, *Wood 12784* (K, LPB); Espíritu Santo, *Buchtien 2268*(US). Santa Cruz: Ichilo, Cerra Amboró, *Lewis 37769* (LPB, MO, US); 4 km S of Huaytu, *Wood 9838* (K, LPB, US).

This form occurs over quite a wide area and is not uniform in the size or shape or indumentum of the bracts. The obovate bracts of *Holliday 26*, for example, are very different from the long, elliptic to subrhomboid bracts of *Wasshausen et al. 2118*. Similarly the pilose bracts of *Prance et al. 6539* are rather different from the subglabrous to thinly pubescent bracts more commonly seen. The common elements are the nearly glabrous, distinct and few-flowered pseudoverticels and large bracts.

Form 4. This form is characterized by its pubescent leaves and distinct inflorescence. The flowers are mainly in the uppermost leaf axils and the uppermost verticels support many-flowered cymes, which are confluent into a dense, terminal thyrse. This is essentially a plant of bushy stream gullies in the Tucuman-Bolivian forest area extending from around Pojo in the Siberia area south to Tarija, where it perhaps intergrades with *Form 1*, which differs by little more than the glabrous leaves. It also extends east into the Chuiqutania plains where it intergrades with *Form 5*. It is also similar to some plants from Peru including *Dicliptera rauhii* and two collections from the Machu Picchu area [*Ugent 5339* (K) and *Stafford 790* (K)], which seem to differ only in having glabrous leaves.

Specimens examined: Cochabamba: Carrasco, on ascent from Pojo to Siberia, *Wood & Ritter 10515* (K, LPB, US); Campero, *Kessler et al. 4601, 4630*(LPB, US). Santa Cruz: Guarayos, ca. 5 km from Ascension on road to Perseverancia, *Wood 9999* (K, LPB, US); Ñuflo de Chavez, between Perseverancia & El Arroyan, *Wood 10048* (K, LPB, US); Ichilo, Río Surutú, *J. Steinbach 6312, 7166* (BM, K); Florida, 2 km W of Samaipata, *Wood 8369* (K, LPB); 5 km below Bermejo in ío Piraí valley, *Wood 8639* (K, LPB, US); La Yunga de Mairana, *Wood 8674* (K, LPB, US); ca. 5 km above Bermejo towards Samaipata, *Wood 9995* (K, LPB, US). Chuquisaca: Boeto, *Kessler et al. 5156* (LPB, US); *Muñoz 15z* (US); 10 km N of Villa Serrano, *Wood 9753* (K, LPB); 1 km below Nuevo Mundo towards Río Grande, *Wood 10867* (K, LPB, US); Tomina, gorge of Río Sillani, *Wood 7946* (K, LPB); 10 km W of Padilla, *Wood 8218* (K, LPB, US); on ridge between Padilla and Monteagudo, *Wood 8229* (K, LPB, US); Río Limon Valley, *Wood 12305* (K, LPB, US); Azurduy, *Kessler et al. 4761, 4768* (LPB, US); 4 km N of Mollini, *Wood & Serrano 14510* (K, LPB, US); Siles, Monteagudo, *Beck 6397* (LPB, US); 12 km E of Monteagudo towards Camiri, *Wood 9685* (K, LPB, US); Calvo, Río Taperillas valley between Monteagudo and Muyu Pampa, *Wood 9722* (K, LPB, US); Serrania Inca Huasi, *Wood, Goyder & Serrano 13255* (K, LPB, US); Jaime Mendoza, *Kessler 5014* (LPB, US). Tarija: Los Pinos near Tarija, *Fiebrig 3133* (K). Potosi: Charcas, *Wood, Atachuachi & Mercado 19226* (BOL, K, LPB).

Form 5. This form is essentially the same as the previous form except that the flowers are clearly in axillary pseudoverticels rather than in a terminal thyrse and so somewhat intermediate with *Form 3*. It is apparently local in relatively open grassy habitats in the Santa Cruz region. It is not clear whether it is simply an adaptation to open situations or whether it differs in some way.

Specimens examined: Santa Cruz: Velasco, San Ignacio, *Seidel 661* (LPB, US); ca. 100 km N of Santa Rosa de la Roca road to Piso Firme, *Wasshausen & Wood 2260* (CAS, K, LPB, US); Ñuflo de Chavez, 16°31'S, 61°50'W, *Mamani & Saucedo 792* (US, USZ); San Javier, *Wood 10062* (K, LPB, US); Parque Nal. Noel Kempff Mercado, Encanto, *Vargas C. 3979* (US, USZ); *E. Ocampo 5250* (US); 15-20 km W of Concepsión, *Wood 12540* (K, LPB, US); Ichilo, km 27 on old road to Cochabamba up side road to Los Espejillos, *Wood 8621* (K, LPB, US).

Form 6. This form appears to be restricted to the Tarija area. It is characterized by having some inflorescences borne on long, axillary peduncles.

Specimens examined: Tarija: O'Connor, road to Entre Rios, *Solomon 10344* (MO, US), *Krapovickas et al. 19029, 19030* (US); 5-6 km W of Entre Rios, *Wood 16384* (K, LPB); Arce, road to Bermejo, *Solomon 9929* (MO, US), valley of Río Chillaguatas, *Solomon 11286* (MO, US): Aviles, near Pinos, *Bastián 463* (LPB, US).

8. **Dyschoriste** Nees

Decumbent to erect perennial herbs with cystoliths; leaves opposite, sessile or petiolate, the margin usually entire; inflorescence of dichasia in leaf axils throughout plant or restricted to axils of distal leaves or bracts and forming a spicate or capitate thyrse; dichasia alternate or opposite, 1-many flowered, sessile to pedunculate, subtended by a leaf or bract; bracts, if present, opposite, green, margin entire; calyx 5-lobed, tube often as

long or longer than lobes during anthesis, regions between lobes usually subbyaline; corolla blue to blue-purple to white, tube gradually or abruptly expanded distally, limb subactinomorphic to bilabiate, upper lip 2-lobed, lower lip 3-lobed; stamens 4, didynamous; anthers 2-thecous, the thecae appendaged basally with awns or stout trichomes; capsule included in persistent calyx, substipitate, subellipsoid to ellipsoid, retinacula present, septa with attached retinacula remaining attached to inner wall of mature capsule, seeds 2-4.

A widely distributed genus of about 50 species throughout the tropics but mainly in open habitats. In the New World the greatest diversity is around the Tropics of Cancer and Capricorn. The genus is almost completely absent from equatorial regions in the neotropics.

Key to the Species of **Dyschoriste**

1a. Calyx glabrous to pubescent but lacking long, straight trichomes, if trichomes present, then < 0.25 mm long; axillary cymes distant, few-flowered, the flowers often solitary; anthers glabrous 2
1b. Calyx pilose with 1.5-2 mm long straight trichomes; axillary cymes often confluent above, many-flowered; anthers glabrous or with a few trichomes on the dorsal surface 4

2a. Small herbs with prostrate stems; leaves to 1.5 cm long; corolla 10 mm long ..... *D. prostrata*

2b. Stems erect or ascending; leaves 1.5-4 cm long; corolla > 13 mm long 3

3a. Corolla 20-23 mm long; leaves obovate-elliptic, broadest above middle; branches herbaceous ..... *D. axillaris*

3b. Corolla 13-16 mm long; leaves lanceolate or oblong-elliptic, broadest below the middle; branches woody .. .. *D. venturii*

4a. Erect herb to ca. 0.75 m; leaves sparsely pubescent especially on the margins, eventually glabrescent; calyx lobes with long, straight trichomes ..... *D. trichanthera*
4b. Perennial herb with decumbent or weakly ascending stems to 40 (-70) cm long; leaves with short, crisped pubescence; calyx lobes with long, straight trichomes mixed with short, crisped pubescence ..... *D. boliviana*

Dyschoriste axillaris Wassh. & J. R. I. Wood, Brittonia 55(1): 11. 2003. TYPE: Bolivia, Chuquisaca, Azurduy, in the gorge below La Angostura, ca. 6 km below Azurduy, 2350 m, 5 Dec 1999, *J. R. I. Wood, Goyder & Serrano 15324* (holotype K; isotypes LPB, US).

Perennial herb from a woody rootstock; stems wiry, ascending, 10-25 cm long, blackish-green, crisped-white puberulent; leaves shortly petiolate, blades obovate or, less commonly, narrowly elliptic; inflorescence of solitary, subsessile flowers in the axils of the uppermost 1-4 leaf pairs, these somewhat distant from each other; bracteoles lanceolate, ciliolate; calyx 10-11 mm long, dull bluish-green, united in a tube for 4-5 mm; corolla funnel-shaped, slightly curved, 5-lobed, weakly 2-lipped, 20-23 mm long, pubescent without, the tube whitish-brown, narrowly cylindrical from a slightly bulbous base, the lobes 7 x 4 mm, oblong-obovate, blue-violet; stamens didynamous; capsule oblong, brown, glabrous except for a few short trichomes at apex.

A very rare but possibly overlooked, near endemic species of two localities in the Bolivia-Tucuman forest belt occurring in scrubby grassland around 2000 m. It is probably vulnerable in the IUCN classification. It appears to flower early in the season, in November-December.

Dyschoriste boliviana Wassh. & J. R. I. Wood, Brittonia 55(1): 13. 2003. TYPE: Bolivia, Tarija, on road from Padcaya to Charaguani, 2100 m, 20 Jan 2000, *J. R. I. Wood & Goyder 15819* (holotype K; isotypes BOL, LPB, UCZ, US-3404222). Fig. 10.

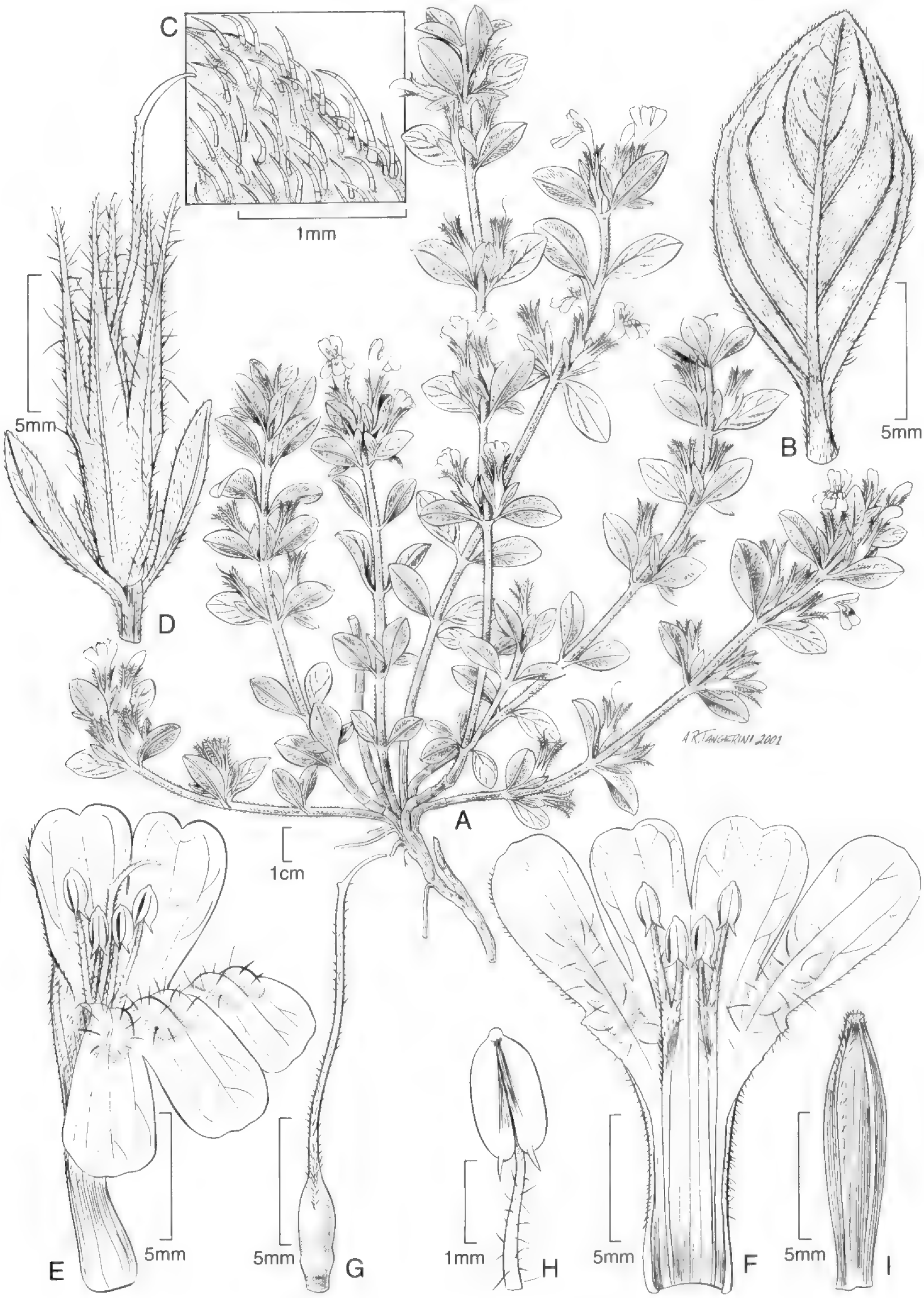


Fig. 10. *Dyschoriste boliviana*. A. Habit. B. Leaf blade. C. Enlargement of leaf blade indumentum, abaxial surface. D. Bracts, bracteoles and calyx lobes. E. Corolla, stamens and stigma. F. Expanded corolla and stamens. G. Pistil. H. Stamens. I. Capsule. (From *J.R.I. Wood & Goyder 15819*, US).

Perennial herb with numerous decumbent or weakly ascending stems arising from a woody rootstock; stems perennial and somewhat woody or, more commonly, plant grazed to the base and stems annual and herbaceous, 5-40(-70) cm. long; leaves shortly petiolate, blades oblong-elliptic or, less commonly, obovate or oblong, commonly folded especially when young, indumentum very variable; inflorescence of dense, many-flowered, subsessile, bracteate cymes in the axils of the uppermost 3-9 (-12) leaf pairs, forming a leafy spike especially when old; bracts variable in size and shape; calyx 13-16 mm long, united in a tube for ca. 6 mm, green except for the darker veins; corolla funnel-shaped, gradually widened from a slightly bulbous base, 5-lobed, weakly 2-lipped, 20-21 mm long, tube whitish, subglabrous, lobes 6-7 mm long, broadly oblong, slightly emarginate, pubescent without; capsule oblong, brown, glabrous, 9-11 mm long.

A common plant of open, shallow, stony grassland along the western margins of the Bolivia-Tucuman forest belt from 1000-2800 m. It is endemic to Bolivia growing from around Totora and Comarapa south to the Padcaya area. It flowers from January to March.

Specimens examined: COCHABAMBA: Carrasco, *Wood 9350* (CAS, K, LPB, US); Campero, *Wood 9471* (CAS, K, LPB, US). SANTA CRUZ: Caballero, *King & Bishop 7632* (US); Florida, *Beck 6770* (LPB, US); El Fuerte, Samaipata, *Wood 8373* (K, LPB); ibid, *Wood 8630* (LPB, US); ibid, *Wood 8630A* (CAS, K, US); 2.5 km N of Mairana-Samaipata highway, *Nee 47696* (NY, UCZ, US); Vallegrande, *Wood 10620* (CAS, K, LPB, US). CHUQUISACA: Siles, *Wood et al. 13285* (K, LPB, US); Tomina, *Wood 7986* (K, LPB, US); *Wood 17856* (K, LPB, US); Leuque Pampa, Padilla-Monteagudo, *Wood 9112* (K, LPB, US); ca. 2 km below Lampacillas on road to Padilla, *Wood et al. 13322* (K, LPB); ca. 10 km N or Sopachuy on road to Tarabuquilla, *Wood & Serrano 14437* (K, LPB, US); on descent from El Rosal to Río Limón, Padilla-Monteagudo, *Wood 16041* (K, LPB, US); Azurduy, *Wood & Serrano 14462* (K, LPB, US). TARIJA: Cercado, Tarija, *Fiebrig 2270* (BM, K); near Yesera, Tarija, *Bastian 442* (US); Arce, Padcaya, *Fiebrig 256* (BM, K); 5 km N of Padcaya, *Beck & Mayko 16206* (LPB, US); 15 km N of La Mamora along road to Padcaya, *Wood & Goyder 16753* (K, LPB, US).

Dyschoriste prostrata Wassh. & J. R. I. Wood, Brittonia 55(1): 15. 2003. TYPE: Bolivia, Chuquisaca, Oropeza, 4 km from Sucre airport along road to Punilla, 2900 m, 22 Mar 1997, *J. R. I. Wood 11890* (holotype K, isotypes LPB, US-3404219).

Low gregarious herb with thickened perennial base with numerous short fibrous roots, ca. 5 cm in length and a few short horizontally spreading rhizomes; stems 10-20 cm long, prostrate or decumbent; leaves subsessile, blades obovate, obtuse or shortly apiculate at apex, ± glabrous; inflorescence of usually solitary flowers borne in small, axillary, subsessile, bracteate cymes in the uppermost 3-5 leaf pairs; bracts variable in size, resembling reduced leaves; calyx 10-11 mm long, the lobes narrowly lanceolate, glabrous; corolla funnel-shaped, gradually widened from a slightly bulbous base, 5-lobed, weakly 2-lipped, 9-11 mm long, the tube whitish, subglabrous, the lobes ca. 3 mm long, obovate-elliptic, pale blue, pubescent without; anthers included and not visible at corolla mouth; capsule oblong, brown, glabrous ca. 9 mm long.

A locally common endemic species of bare, exposed hilltops between 2500 and 3000 m in central Bolivia, principally around Sucre. It flowers from January to March.

Specimens examined: COCHABAMBA: Carrasco, *Wood 8958* (CAS, K, LPB, US); Campero, *Wood et al. 19452* (BOL, K, LPB, UCZ). CHUQUISACA: Oropeza, *Wood 7846* (K, LPB, US); W of Sucre just before descent to Río Cachimayo, *Wood 9166* (CAS, K, LPB, US); between La Recoleta and the Hunting Club, Sucre, *Wood 14381* (K, LPB, US); Zudañez, ca. 5 km from Mococoya towards Sacha Pampa, *Wood & Serrano 13386* (K, LPB, US); Yamparaez, *Wood 17853* (K, LPB, US).

Dyschoriste trichanthera Kob., Ann. Missouri Bot. Gard. 15:29. 1928. TYPE: Paraguay, in region along the river Apa, *Hassler 7780* (holotype G).

Stem stout, branched, erect, 50-60 cm, glabrate, pubescent near apex; leaves oblong-ovate to ovate, 5-7 x 2-3 mm; flowers axillary, crowded at nodes near apex giving spicate appearance; bracts small, foliaceous; bracteoles 4-7 mm long; calyx 13-14 mm long, lobes subulate-setaceous; corolla distinctly bilabiate, 10-20 mm long, rose or violet, lobes obtuse, emarginate, puberulent without.

A lowland plant of grassy cerrados in Paraguay and Matto Grosso in Brazil with a single collection from Bolivia.

Specimens examined: SANTA CRUZ: Velasco, *Wood 13154* (K, LPB, US).

Dyschoriste venturii Leonard, Lilloa 6(2):436. 1941. TYPE: Argentina, Santiago del Estero, *Venturi 5865* (holotype US-1545059; isotype NY).

Herbs, becoming suffrutescent at base; stems erect, ascending or procumbent, to 60 cm long, subterete, puberulent, or glabrescent; leaves petiolate, ovate to oblong, 2-4 x 1-3 cm, puberulent or glabrous; inflorescence axillary; flowers sessile or subsessile, or lowermost on short peduncles, 1-several in each axil; bracts leaf-like, usually about as long as calyx tube but sometimes longer, puberulent or glabrous; calyx 8-14 mm long, puberulent, ciliolate; corolla white or light violet, pubescent, tube 10-12 mm long, lobes 4-5 mm long; capsule 10 x 3 mm, glabrous or pubescent at tip.

Locally frequent in very dry, open spiny bushland on poor, well-drained stony plain or rolling hills at 1600-1700 m. Growing sporadically in the western chaco and extending into the Rio Grande valley system of Andean Bolivia. Flowers after rain in January to March.

Specimens examined: COCHABAMBA: Campero, *Wood 11735* (K, LPB, US). SANTA CRUZ: Caballero, *Solomon 15953* (MO, NY, US); *Gutiérrez et al. 1463* (MO, US); *Solomon & Nee 17974* (MO, NY, US); *Wood 10392, 10546, 10942*,(K, LPB, US); Cordillera, *Beck 6440* (LPB, US); *Saravia 11628* (CTES, US); *Wood 16059* (K, LPB, US). CHUQUISACA: Boeto, *Wood 10667* (K, LPB); Calvo, *Saravia 11835* (CTES, US).

9. **Elytraria** Michx.

Elytraria imbricata (Vahl) Pers., Syn. Pl. 1:23. - *Justicia imbricata* Vahl, Ecolog. Amer. 1:1. 1796. - *Elytraria tridentata* Vahl, Enum. Pl. 1:107. 1804, nomen superfl. (*Justicia imbricata* Vahl cited as synonym). TYPE: not located, based on material from "herbario Marcgravii".

Verbena squamosa Jacq., Pl. Hort. Schoenbr. 1:3. 1797. - *Tubiflora squamosa* (Jacq.) Kuntze, Rev. Gen. Pl. 2:500. 1891. - *Elytraria squamosa* (Jacq.) Lindau, Anales Inst. Fis.-Geogr. Nac. Costa Rica 8:299. 1895. TYPE: unknown. Fig. 11.

Caulescent perennial herb to 50 cm; stem subterete to sharply 3-angulate, sparsely pubescent; leaves clustered at stem apices, subsessile to petiolate; blades elliptic to obovate, 2.5-13.5 x 1-4.5 cm, pubescent, margin entire to crenate; inflorescence of scapose or pedunculate densely bracteate terminal dichasiate spikes, the spikes slender, cylindric, scapes or peduncules covered with imbricate coriaceous clasping scales; bracts alternate, green with hyaline margin, ovate to elliptic, 3-6 x 1.5-3 mm, 3-dentate apically, glabrous; bracteoles 2, subulate; calyx deeply 4-lobed, mostly hyaline, lobes heteromorphic; corolla blue and white, 3.5-7.5 mm long, glabrous, tube cylindric, limb bilabiate, lower lip 3-lobed, lobes apically cleft, upper lip 2-lobed; stamens 2; anthers 2-thecous, the thecae lacking basal appendages; capsule estipitate, subconic to ovoid; seeds 12-16. Extremely variable in its habit form, ranging from small plantainlike herbs of a few centimeters to subligneous-stemmed plants 50 cm high.

Throughout the neotropics, usually growing in disturbed, open habitats (e.g. roadsides) at low elevations (below 300 m).

Specimens examined: BENI: Reyes, *Rusby 1115* (NY, US). SANTA CRUZ: Velasco, *Kuntze s.n.* (NY, US), *Seidel & Beck 238, 473* (LPB), *Guillén & Choré 1316* (MO, US, USZ); Ñuflo de Chávez, *Krapovickas 32069, 32163* (CTES, MO, US), *Quevedo & Centurión 570* (LPB), *Wood 12537* (K, LPB, US); Chiquitos, *Jardim 2230* (US, USZ), *Wood & Mamani 13426* (K, LPB, US); *Wood 17901* (K, LPB, US). TARIJA: Gran Chaco, *Beck 11652* (LPB, US), *Lara s.n.* (LPB).

10. **Eranthemum L.**

Eranthemum pulchellum Andrews, Bot. Repos. 2: pl. 88. 1800. – *Justicia pulchella* (Andrews) Roxb. in Pl. Corom. 2:41. t. 177. 1805. - *Pseuderanthemum pulchellum* (Andrews) Merr., Phil. Journ. Sci. Bot. 7:248. 1912. TYPE: based on Andrews's description and plate, especially the latter.

Justicia nervosa Vahl, Enum. Pl. 1:164. 1804. - *Eranthemum nervosum* (Vahl) R. Br. ex

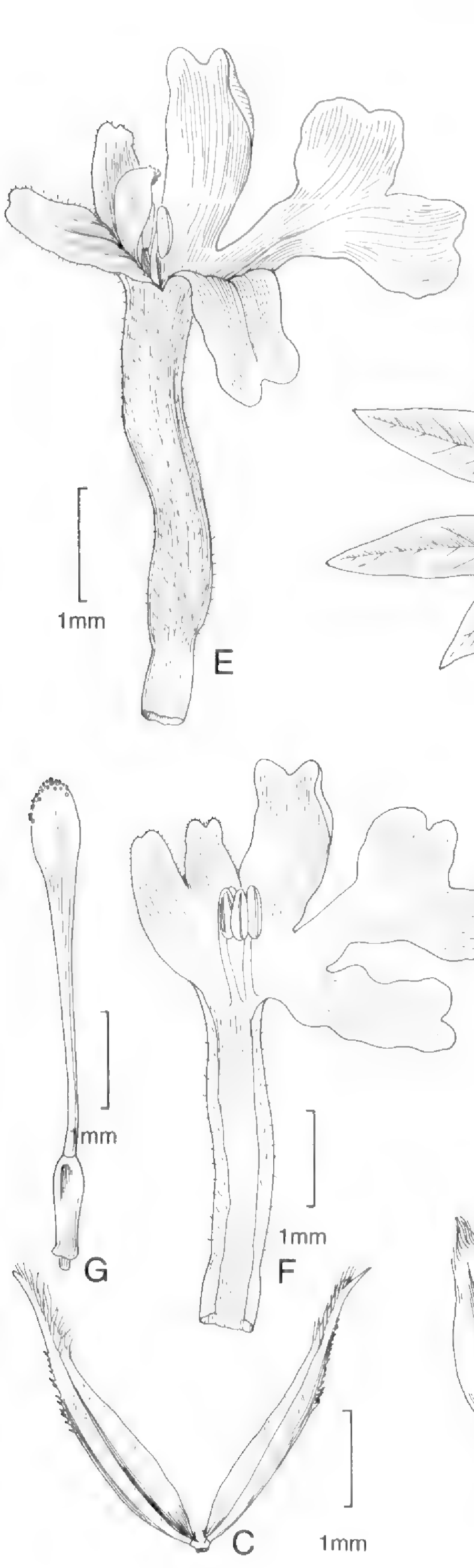


Fig. 11. *Elytraria imbricata*. A. Habit. B. Bract. C. Bracteoles. D. Calyx lobes. E. Corolla. F. Corolla expanded. G. Pistil and ovary. (A, from *A. Krapovickas & Schinini 32163*, US; B-D, from *D. Wasshausen et al. 1953*, US; E-G, from *St. Beck et al. 11652*, US).

Roem. & Schult., Syst. 1:174. 1817. *Daedalacanthus nervosus* (Vahl) T. Anders., J. Linn. Soc. 9:487. 1867. TYPE: based on Röttler specimen from India. Fig. 12

Erect undershrub to 2 m; leaves petiolate, blades elliptic, acute, 5-25 x 1.5-9 cm, entire, glabrous; inflorescence a trichotomously branched panicle formed of short, subsessile spikes terminal on branches, spikes 3-8 cm long; bracts oblong to oblanceolate, mucronate, glabrous, variegated white and green, neither ciliolate nor spinescent; bracteoles linear, ca. 6 mm long; calyx scarious, puberulent, deeply 5-lobed, ca. 7 mm long, lobes linear; corolla blue, glabrous 15-30 mm long, tube cylindrical, lobes ovate, spreading ca. 6-8 x 5-7 mm; stamens 2, inserted at throat; anthers 2-thecous, emucronate; staminodes 2, small, shortly connate to filaments; capsule with solid stipe-like basal part, glabrous, 10-15 x 10 x 10 mm, 4-seeded; retinacula present, septae with attached retinacula remaining attached to inner wall of mature capsule.

A native of India but widely cultivated in tropical countries.

Specimens examined: SANTA CRUZ: cultivated in Concepción.

11. **Fittonia** E. Coem.

Fittonia albivenis (Lindl. ex Veitch) Brummitt, Curtis's Bot. Mag., 182(4):165. 1979. - *Adelaster albivenis* Lindl. ex Veitch, Gard. Chron. 1861:499. 1861. TYPE: plant cultivated in London by Veitch from plants sent from Peru by Pearce; specimen apparently not preserved.

Fittonia argyroneura Coem., Fl. Serres Jard. Eur. 16:103, tab. 1866. TYPE: plant cultivated in Belgium, originally from Peru via William Bull of London; specimen not traced.

Illustration: 1980. Brummitt in Curtis's Bot. Mag. 182(4): 166 & t. 788.

Creeping herb, rooting at nodes with stems ascending to flower to 25(-35) cm; stems quadrangular, villous; leaves petiolate, blades broadly ovate to broadly elliptic, 2-12 x 1-8 cm, glabrous, with a conspicuous reddish reticulate venation; inflorescence a dense terminal spike 1-9 cm long; bracts conspicuous, imbricate, green, cuneate to suborbicular, 5-12 x 3-5 mm, glandular-pubescent, margins entire; flowers sessile in axils of bracts; bracteoles 2, linear-triangular; calyx slightly exceeding bracteoles, lobes 5, linear-triangular, spreading-pubescent; corolla lemon-yellow or with slightly purplish tinge on outside, 10-14 mm long, sparsely spreading-pubescent, lower part narrowly tubular, pale cream, 2-lipped, lower lip 3-lobed, lateral lobes lemon-yellow, median lobe deeper yellow and sometimes purplish in center, upper lip oblong, entire or subentire, arching over, lemon-yellow or with slight purplish tinge; stamens 2; anthers 2-thecous, the thecae equal, muticous at base; capsule 4-seeded.

Fittonia is native to Ecuador, Peru and Bolivia but is a widely cultivated greenhouse plant in temperate countries because of its attractive foliage with brightly colored veins.

Specimens examined: PANDO: Nicolás Suárez, *Fernández 8120* (NY). LA PAZ: Tumupasa, *White 2348* (NY, US); Ixiamas-Tumupasa, *Williams 1297* (BM, NY); Iturralde, *De Walt 27* (LPB). WITHOUT PRECISE LOCALITY: Gualquisa, *Pearce s.n.* (BM).

12. **Geissomeria** Lindl.

Geissomeria tetragona Lindau, Bull. Herb. Boiss., ser. I, 5:658. 1897. TYPE: Brazil, Mato Grosso, *Lindman A.3167* (lectotype S, here chosen). Fig. 13.

Herb or subshrub 0.8-1.5 m; younger stems puberulous; leaves petiolate, blades long-oblong, 12-22 x 3-5.5 cm, membranous, glabrous, narrowed at base and decurrent on petiole, margin entire; inflorescence 4-angled spikes, terminal and axillary, erect, pedunculate; bracts red, lanceolate, 5 x 2.5 mm, margin entire; bracteoles 2, 4 x 1 mm; calyx 5-lobed, lobes subequal, stiff, margin hyaline; corolla red, tube 25 mm long, puberulous, limb subregular, short, lower lip 3-lobed, lobes dark-red, upper lip 2-lobed, lobes obtuse, 1 mm long, dark-red; stamens 4, subdidynamous; anthers 1-thecous, apically bearded and adglutinate; capsule thick, oval, nitid; seeds 4.

Frequent and very characteristic of seasonally dry Chiquitano forest up to ca. 700 m on the pre-

Fig. 12. *Eranthemum pulchellum*. A. Habit. B. Bract. C. Bracteoles. D. Calyx. E. Corolla. F. Corolla expanded. (A, *P. Hutchinson 2781*, US; B-F, *F. Rauch & Crivelone s.n.*, US).

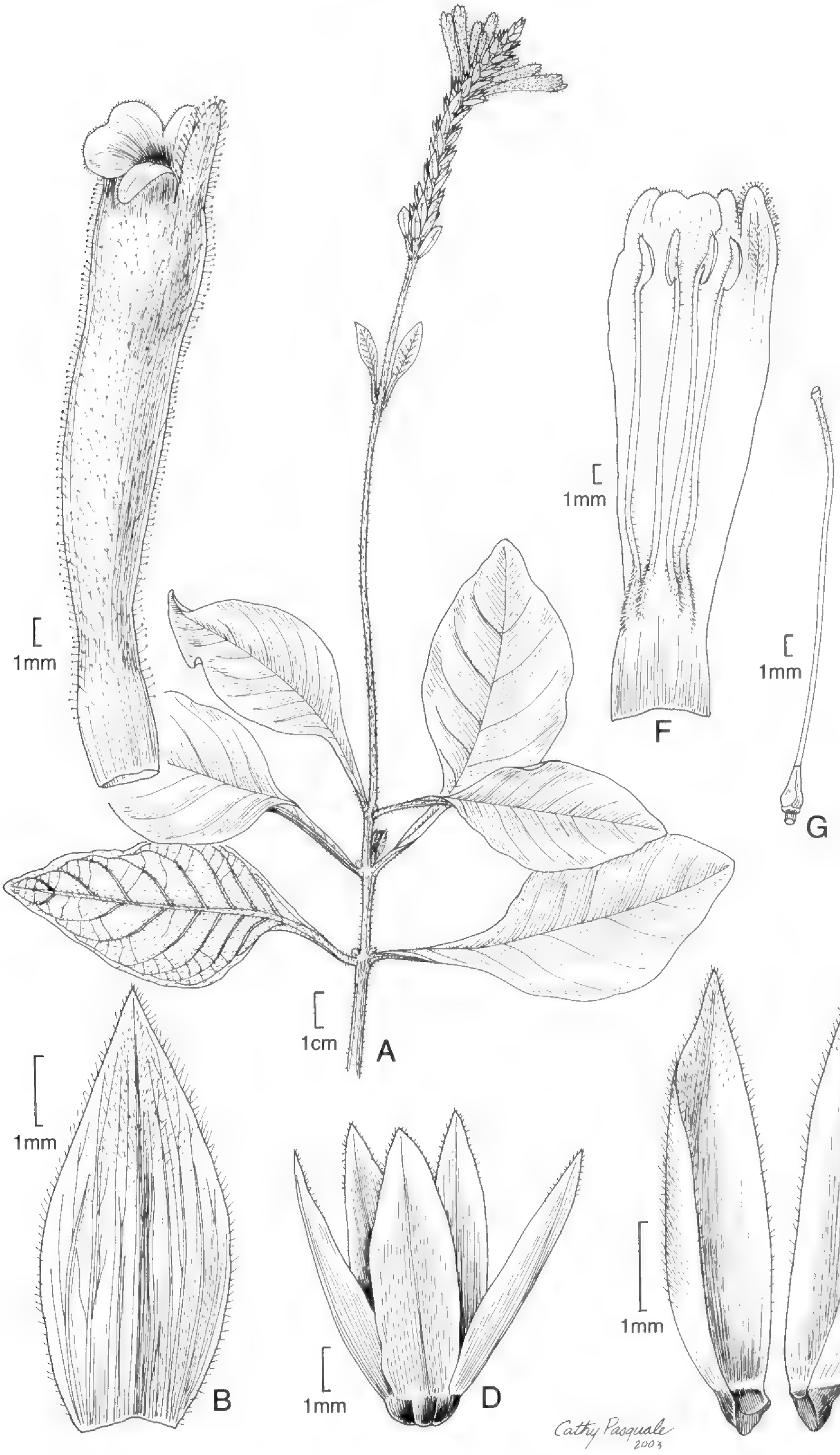


Fig. 13. *Geissomeria tetragona*. A. Habit. B. Bract. C. Bracteoles. D. Calyx lobes. E. Corolla. F. Corolla expanded. G. Pistil and ovary. (from *A. Krapovickas & Schinini 31826*, US).

Cambrian shield of eastern Bolivia, extending into Brazil in similar habitats. It flowers throughout the dry season from March to October.

Specimens examined: Santa Cruz: Velasco, *Gutiérrez 751* (MO, US, USZ), *Kuntze s.n.* (NY, US), *Nee 41363* (NY, US), *Seidel 180, 690* (LPB, US), *Fisel 18, 41* (LPB, US), *Jardim 552* (MO, US, USZ), *Killeen 5040* (MO), *Wasshausen & Wood 2256* (CAS, GOET, K, LPB, US); Ñuflo de Chávez, *Krapovickas 31826, 31920, 32116* (CTES, US), *Killeen 1004* (LPB, NY), *Vargas 559* (LPB, MO, NY), *Toledo 152* (LPB), *Quevedo & Centurión 518* (LPB, MO), *573* (LPB), *Wood 12520* (K, LPB, US); Chiquitos, *D'Orbigny 663* (P, W), *Daly et al. 2125* (LPB, MO, NY, US), *2233* (NY).

13. **Hemigraphis** Nees

Hemigraphis alternata (Burm. f.) T. Anderson, J. Linn. Soc. Bot. 7:114. 1863. - *Ruellia alternata* Burm. f., Fl. Indica 135. 1768. Type: sin. col. 1757 (G-BU).

Ruellia colorata Blume, Bijdr. 3:795. 1826. - *Hemigraphis colorata* (Blume) Hallier f., Nova Acta Leopoldiana, Abh. Deutsch Akad. Naturforscher 70; 199. 1897. [1898]. Type: Java, *Zollinger 544* (syntypes B, G-BOIS, G-DC).

Blechum cordatum Leonard, Carnegie Inst. Wash. Publ. 461:200. 1936. Type: Belize, *Bartlett 11355* (MICH). Fig. 14.

Low-growing diffuse herb 30-35 cm; stems subquadrangular, puberulous, rooting at lower nodes; leaves petiolate, blades broadly ovate to ovate-oblong to cordate, 3-11 x 2-7 cm, glabrous, underside purple, portions turning indigo upon drying, margin crenate; inflorescence of axillary and terminal, pedunculate, densely bracted, 4-sided dichasiate spikes, 2-3 cm long; bracts ovate-lanceolate to oblong, 8-15 x 4.5 mm, turning indigo upon drying, margin entire; calyx 5-lobed, lobes equal, linear-subulate; corolla white, 15-18 mm long, pubescent, tube slender, limb subregular, and ± equally 5-lobed, lobes 4 x 4 mm; stamens 4, didynamous; anthers 2-thecous, muticous at base. Fruit unknown.

Old World species commonly cultivated for ground cover in the tropics and greenhouse collections in temperate countries.

Specimens examined: Beni: Ballivián, *Oviedo 29* (LPB, US).

14. **Herpetacanthus** Nees

Herpetacanthus rotundatus (Lindau) Bremek., Rec. Trav. Bot. Néerl. 35:163. 1938. - *Juruasia rotundata* Lindau, Bull. Herb. Boiss. ser. II, 4:403. 1904. Type: Brazil, Amazonas, *E. Ule 5573* (holotype B, destroyed; isotypes G, K). Fig. 15.

Herb or subshrub 0.5-1.5 m; stems quadrangular, puberulous; leaves petiolate, blades elliptic to narrowly ovate, 6-14 x 4-6.5 cm, glabrous, margin entire; inflorescence terminating main and lateral branches, spikes solitary or in groups of 2 or 3, 3-4 cm long, shortly pedunculate; bracts pale green, ovate-orbicular, 12-13 x 8-10 mm, usually somewhat oblique, glabrous, margin entire, ciliate; flowers alternate, in pairs or singly between paired bracts; calyx 5-lobed, lobes subequal, lanceolate; corolla small, white or pale violet, straight 15-16 mm long, glabrous, tube 11-12 mm long, limb bilabiate, lower lip 3-lobed, lobes subequal, erect or ± spreading, lower lip erect, emarginate; stamens 4, didynamous; anthers of longer pair 2-thecous, the thecae superposed, those of shorter pair 1-thecous, all basally obtuse; capsule stipitate, head ellipsoidal; seeds 2-4. Rare neotropical flood plain species.

Specimens examined: Beni: Ballivián & Yacuma, *Guareco 488* (US).

15. **Hygrophila** A. Br.

Hygrophila costata Nees, Pl. Hort. Bonn. Icon. 2:7, t.3. 1824. Type: based on plants cultivated in medicinal garden at Bonn; specimens apparently not preserved.

Hygrophila brasiliensis (Spreng.) Lindau, in Urban, Symb. Antill. 2:183. 1900. - *Ruellia brasiliensis* Spreng., Syst. 2:822. 1825. Type: Brazil, without locality, *Sellow s.n.* (various collections from Brazil are extant at K that pertain to this species).

Hygrophila quianensis Nees, in Benth., London J. Bot. 4:634. 1845. Type: Guyana, Pirara, *R. Schomburgk* 2nd coll. *331* (291) (holotype K; F photo 26559; isotypes BM, G).

Illustration: Fig. 12, 1995. Acanthaceae, pp. 1-158 in Flora of Chiapas, Pt. 4, D. E.

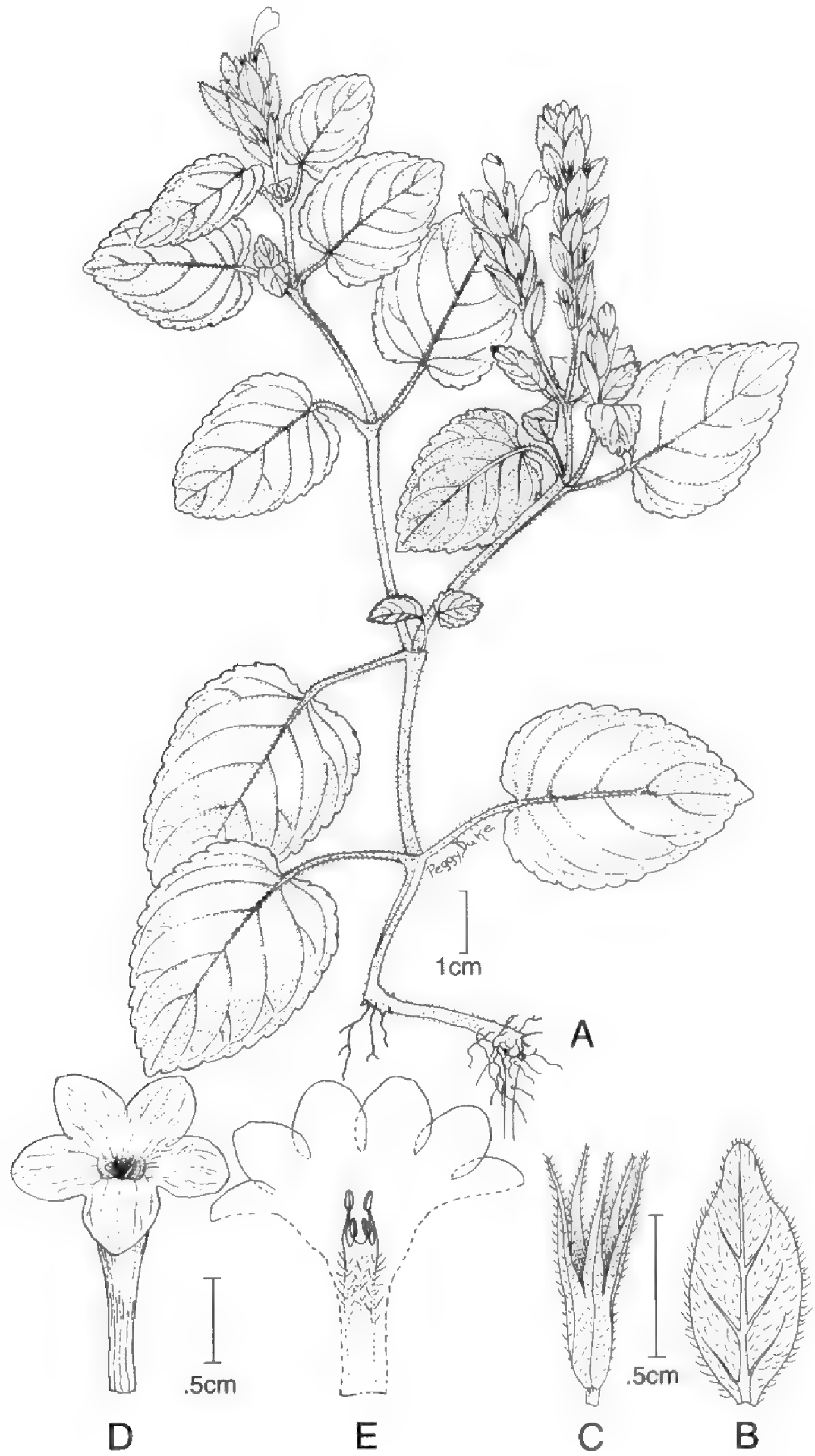


Fig. 14. *Hemigraphis alternata*. A. Habit. B. Bract. C. Calyx lobes. D. Corolla. E. Corolla expanded. (From *R. Fosberg 29103*, US).

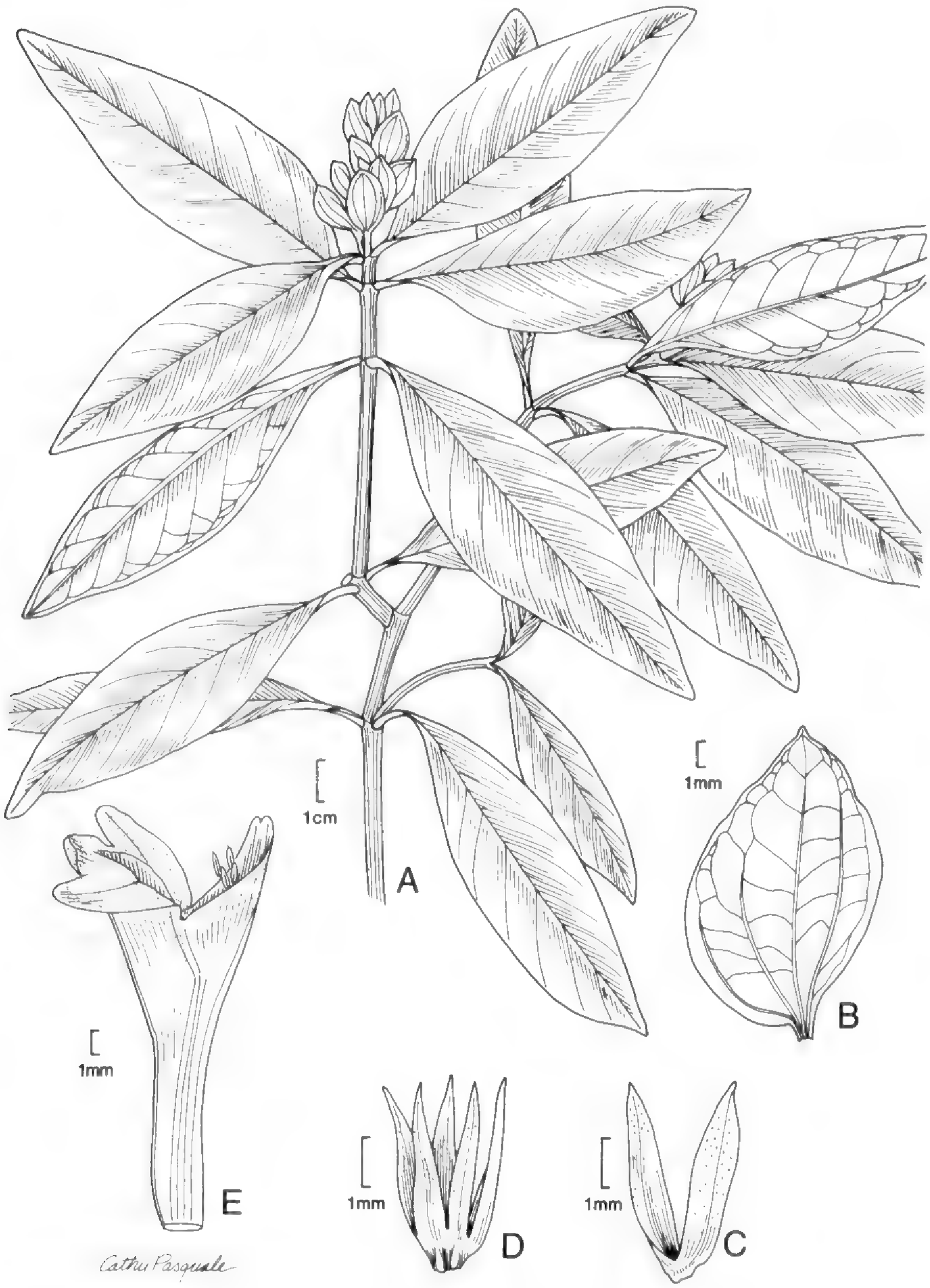


Fig. 15. *Herpetacanthus rotundatus*. A. Habit. B. Bract. C. Bracteoles. D. Calyx lobes. E. Corolla. (A, from *V. Funk 8357*, US; B-D, from *E. Ule 5573*, G; E, from *F. Encarnación 1162*, US).

Breedlove, ed. California Academy of Sciences, San Francisco.

Erect to spreading aquatic to subaquatic herbs, 0.5-2 m; stems quadrate-sulcate to hexagonal-ridged, reddish, glabrous; leaves subsessile to petiolate, blades lanceolate to narrowly elliptic, 5-25 x 0.5-4 cm, glabrate, margin entire; inflorescence of dichasia in leaf axils, often appearing as verticils, dichasia opposite or alternate, 5- or 7-flowered; bracts and bracteoles narrowly elliptic to linear, glabrous, margin entire, ciliate; calyx 5-lobed, lobes equal, often basally fused for about one third their length, margin whitish or hyaline; corolla white, 6-9 mm long, pubescent, tube cylindrical, upper half funnel-shaped, limb subregular to bilabiate, lower lip 3-lobed, upper lip 2-lobed; stamens 4, didynamous; anthers 2-thecous, lacking basal appendages; capsule estipitate, narrowly oblong, glabrous; seeds 12-18.

Widespread lowland aquatic species, very variable in its leaf form. Probably flowering throughout the year but mostly in the dry, winter season.

Specimens examined: Beni: Ballivián, *Beck 16477* (LPB, US); Marban, *Seidel 6631* (LPB, US). La Paz: Tamayo, Apolo, *Williams 79* (BM, K, NY, US); Laracaja, Mapiri Region, San Carlos, *Buchtien 1359* (NY, US), *1988* (US). Cochabamba: Chapare, *R. Steinbach 422* (MO, NY, US). Santa Cruz: Ichilo, *Beck 19680* (LPB, US), *Nee 40263* (MO, NY, US), *J. Steinbach 2592* (LIL, US), *Wilson 41* (LPB); Ñuflo de Chávez, *Fuentes 784* (LPB); *Wood 14374* (K, LPB).

16. **Hypoestes** Solander ex R. Br.

Hypoestes phyllostachya Baker, J. Linn. Soc., Bot. 22:511. 1887. Syntypes: Madagascar, central Madagascar, *R. Baron 4907* (K; isosyntype P); Trabonji, *Hildebrandt 3444* (K; isosyntype P).

Illustration: Fig. 13; 1995. Acanthaceae. Pp. 1-158 in Flora of Chiapas, pt. 4, D. E. Breeedlove, ed. California Academy of Sciences, San Francisco.

Spreading perennial herbs 50-60 cm; stems quadrate-sulcate, glabrate; leaves petiolate, blades ovate, 3-6 x 2.5-3.5 cm, glabrate, thin, surfaces beset with pink irregularly shaped spots, margin entire; inflorescence of axillary and terminal dichasiate spikes, collectively forming a terminal leafy panicle; dichasia 1- to several-flowered, sessile, alternate along spikes; bracts heteromorphic, elliptic to subcircular, pubescent, spotted like leaves; flowers subtended by 2 pairs of bracteoles, outer pair fused proximally for < ½ their length, inner pair partially fused to outer pair, ± equal in length, both pairs pubescent; calyx 5-lobed, partially hyaline, pubescent, lobes equal; corolla resupinate, rose-pink to lilac with white markings on lower lip, 20-29 mm long, pubescent, tube subcylindric to ± abruptly expanded distally into a throat, limb bilabiate, lower lip recoiled, entire, upper lip reflexed, 3-lobed; stamens 2, exserted; anthers 1-thecous, the thecae lacking basal appendages; capsule stipitate, head subellipsoid to obovoid, pubescent; seeds 4.

Madagascan endemic, widely cultivated and now naturalized in some regions of the Neotropics, including Bolivia.

Specimens examined: La Paz: Sud Yungas, *Wood 8609* (LPB). Tarija: Gran Chaco, *Beck 11628* (LPB, US).

17. **Justicia** L.

Perennial herbs or undershrubs with cystoliths; leaves sessile or petiolate, margin entire or sinuate; inflorescence of 1(-3)-flowered diachasia in leaf axils forming terminal spikes, sometimes compounded into panicles; bracts very variable, sometimes prominent and/or brightly colored, margin entire; calyx deeply (4-)5-lobed, lobes equal or rarely unequal; corolla with a distinct tube, strongly 2-lipped, upper lip entire or 2-lobed, lower lip 3-lobed; stamens 2; anthers 2-thecous, the thecae inserted at same level or varyingly superposed, one or both basally appendaged; capsule stipitate, usually obovate; retinacula present, septa with attached retinacula remaining attached to inner wall of mature capsule, seeds 2-4. *Justicia* is the largest and taxonomically most complex genus of the Acanthaceae with estimates of up to 600 species worldwide (Graham, 1988, Mabberley, 1997). It is also the largest genus of the family in Bolivia with about 70 species.

In the following key, the species of *Justicia* are divided into five groups based on the number of calyx lobes and the form of the inflorescence. Unfortunately the subgeneric classification of *Justicia* is not easy and the most recent account (Graham 1988) is unsatisfactory as far as the Bolivian species are concerned. The groups below are at least partially artificial but reflect the difficulties of making clear-cut divisions within *Justicia*. Even the 4-lobed/5-lobed calyx dichotomy breaks down among some species, notably *J. hassleri* and *J. pectoralis* where a rudimentary and easily missed 5th calyx lobe is present; likewise the distinction between panicles, spikes, clusters etc. is not always clear. In order to overcome these problems and facilitate identification several species occur on into five groups provides some (but not all) the facilities of a multi-entry key.

Key to the Groups

1a. Calyx 4-lobed; corolla relatively small, < 35 mm in length and usually much shorter ..... *Group A*
1b. Calyx 5-lobed; corolla small or large 2

2a. Inflorescence a loose open panicle, either clearly terminal, branches subtended by small bracts or (rarely) axillary with branches subtended by leaves; floral bracts small and inconspicuous ..... *Group B*
2b. Inflorescence varied, formed of spikes, clusters or cymes but, if apparently paniculate, then with well-developed broad bracts 3

3a. Inflorescence clearly spicate, terminal and/or axillary spikes elongate, usually with clearly defined bracts which are obviously distinct from both true leaves and calyx lobes ..... *Group C*
3b. Inflorescence of varied form, but if elongate and spike-like, the bracts either linear and resembling calyx lobes or leaf-like and forming terminal leafy (rather than bracteate) spikes 4

4a. Inflorescence of small panicles, cymes or heads, about as broad as long and usually very dense flowered but if slightly elongate bracts and calyx lobes similar ..... *Group D*
4b. Inflorescence of terminal leafy spikes, flowers either axillary or in small, few-flowered axillary spikes, in which bracts resemble small leaves ..... *Group E*

Group A has two main elements: the first subgroup consists of those species which have an inflorescence of 1 (-2) simple, relatively lax, terminal spikes with inconspicuous linear to triangular bracts, small corollas, less than 25 mm long and tuberculate seeds. The flowers are at most only weakly imbricate. The second subgroup consists of species with dense terminal and axillary, often somewhat 1-sided spikes, pink flowers and strongly superposed anther cells. Amongst the other, rather heterogeneous assemblage of species, there are two with a spicate inflorescence and conspicuous imbricate bracts and a group of sticky glandular species. In this latter group the inflorescence is mostly formed of panicled spikes.

Group A

1a. Floral bracts conspicuous, longer than calyx, ovate-elliptic, imbricate 2
1b. Floral bracts inconspicuous, linear, (ob-)lanceolate or triangular, shorter than calyx, imbricate or not 4

2a. Corolla pink, red or maroon; bracts foliose ..... *J. ramulosa*
2b. Corolla white, yellowish to lilac; bracts clearly distinct from leaves 3

3a. Spikes solitary, terminal, pedunculate; corolla white or yellowish; leaves pilose below ..... *J. yurimaguensis*
3b. Spikes usually several, terminal and from upper leaf axils, sessile; corolla white with lilac markings; leaves at most puberulent below ..... *J. dubiosa*

4a. Spikes terminal and axillary, sometimes forming a loose paniculate inflorescence and sometimes condensed into a head-like inflorescence 5

4b. Inflorescence strictly spicate, spikes terminal only, almost always solitary but to 3 together in *J. boliviana* 14

5a. Corolla cream 6
5b. Corolla pink or pale blue 7

6a. Inflorescence a large, open panicle of spikes; leaves glabrescent ..... *J. glutinosa*
6b. Inflorescence compact, formed of congested spikes from uppermost leafy axils; leaves hirsute ..... *J. israelvargasii*

7a. Corolla pale blue, very small, < 7.5 mm long; calyx with a rudimentary 5th lobe; flowers solitary, arranged in a true panicle ..... *J. pectoralis*
7b. Corolla pink or reddish, 10 mm long; calyx strictly 4-lobed; flowers mostly in opposite pairs arranged in spikes or a panicle of spikes 8

8a. Leaves and inflorescence sticky-glandular pubescent; spikes lax 9
8b. Leaves and inflorescence never sticky, usually eglandular except occasionally on inflorescence; spikes very dense 10

9a. Flowers in few-flowered cymes in upper leaf axils; corolla orange ..... *J. adhaerens*

9b. Flowers in very lax spikes, commonly developing into an open panicle of spikes ..... *J. saltensis*

10a. Bracts 3-4 mm wide, foliose and not readily distinguished from leaves, much longer than calyx; spikes not 1-sided ..... *J. ramulosa*
10b. Bracts to 2 mm wide, clearly different from leaves although resembling calyx lobes, shorter than or equal to calyx; spikes usually 1-sided 11

11a. Corolla tube clearly expanded in middle, lips to 11 mm long; inflorescence relatively lax with individual flowers separate ..... *J. tocantina*
11b. Corolla tube narrowly cylindrical throughout its length, lips to 7 mm long; inflorescence very dense, individual flowers not easily separated 12

12a. Spikes and leaves sessile; rudimentary 5th calyx lobe present ..... *J. hassleri*
12b. Spikes pedunculate; leaves petiolate; calyx strictly 4-lobed 13

13a. Spikes elongate; corolla tube < 15 mm long, lips glabrescent ..... *J. goudotii*
13b. Spikes rounded; corolla tube 14-18 mm long; lips brown-pilose ..... *J. kessleri*

14a. Corolla pink; leaves ovate (except in odd forms of *J. pluriformis)* 15
14b. Corolla white, cream or blue; leaves oblong-elliptic, lanceolate or ovate 17

15a. Flowers strongly imbricate; plants pilose ..... *J. chuquisacensis*
15b. Flowers clearly separate on rhachis and ± distant; leaves glabrous to sparsely pubescent 16

16a. Leaves grey/whitish beneath; spike pilose ..... *J. praetermissa*
16b. Leaves green beneath; spike sparsely pubescent ..... *J. pluriformis*

17a. Leaves linear-oblong; flowers distant ..... *J. lutensis*
17b. Leaves expanded, oblong-elliptic to ovate; flowers imbricate to slightly lax 18

18a. Corolla cream with some violet markings in throat; leaves glabrous or pubescent only on veins below 19
18b. Corolla blue (very rare albino form exists); leaves pubescent below 21

19a. Calyx, corolla and capsule glandular-pilose ..... *J. chapareënsis*
19b. Calyx and corolla glabrous or minutely puberulent; capsule glabrous 20

20a. Leaves lanceolate, glabrous, to 15 cm long; spikes commonly paired, 5-18 cm long, lax ..... *J. boliviana* ssp. *boliviana*
20b. Leaves ovate, often pubescent on veins below, to 8 cm long; spikes always solitary, 3-12 cm long, dense .... *J. boliviana* ssp. *subintegrifolia*

21a. Corolla 29-32 mm long. ..... *J. steinbachiorum*
21b. Corolla < 20 mm long 22

22a. Corolla 10-13 mm long; capsule pubescent ..... *J. vernalis*
22b. Corolla 15-18 mm long; capsule glabrous ..... *J. rusbyana*

Paniculate group. All species in group B are essentially herbaceous and have an open, lax paniculate inflorescence with inconspicuous bracts. Species where the flowers are clearly arranged in a panicle of spikes are placed either in Group A (*J. glutinosa*, *J. saltensis*) if they have a 4-lobed calyx or in Group C if the bracts are conspicuous. Emphasis on open panicles, either axillary or terminal.

Group B

1a. Panicles terminal, branches subtended by bracts which are much smaller than leaves 2
1b. Panicles axillary and terminal, lower branches, at least, obviously subtended by leaves 7

2a. Panicle branches verticillate; corolla very small, 3-5 (17) mm long ..... *J. comata*
2b. Panicle branches not verticillate; corolla more than 5 mm long 3

3a. Corolla red, > 40 mm long ..... *J. tenuistachys*
3b. Corolla pink, blue or yellow, < 15 mm long 4

4a. Leaves conspicuously pilose ..... *J. dryadum*
4b. Leaves glabrous 5

5a. Corolla pale blue; calyx with one lobe much smaller than other 4; plant fragrant ..... *J. pectoralis*
5b. Corolla yellow or cream-colored; calyx subequally 5-lobed; plant not fragrant 6

6a. Corolla cylindrical, 7-10 mm long ..... *J. yungensis*
6b. Corolla gaping, < 5 mm long ..... *J. lineolata*

7a. Corolla 25-55 mm long ..... *J. boliviensis*
7b. Corolla 5-20 mm long 8

8a. Corolla strongly bent around middle; ultimate branches of panicle curved ..... *J. arcuata*
8b. Corolla straight; ultimate branches straight 9

9a. Corolla pubescent ..... *J. glaziovii*
9b. Corolla glabrous 10

10a. Calyx lobes 5-10 mm long, usually pubescent or pilose ..... *J. kuntzei* ssp. *robusta*
10b. Calyx lobes 2-4 mm long, glabrous 11

11a. Pedicels glabrous ..... *J. kuntzei* ssp. *kuntzei*
11b. Pedicels pilose ..... *J. cuzcoensis*

Spicate group. Group C consists of those species with a clearly elongate, spicate inflorescence, in which the bracts are expanded, imbricate and clearly different from both the leaves and the calyx lobes. Very often the spikes are aggregated into a terminal panicle of spikes. Included are all species with a clearly spicate, terminal inflorescence which were not included in Group A. Excluded are all species where the spike is short, dense and head-like (Group D), where the calyx is 4-lobed (Group A) or where the spikes are formed of flowers arising in the axils of the leaves, thus forming a leafy, rather than a bracteate terminal spike (Group E). Spikes may be terminal and/or axillary, simple or compounded.

Group C

1a. Spikes short, clustered densely at top of stem; bracts dark purple; cultivated species ..... *J. scheidweileri*
1b. Spikes long or short, axillary or forming a terminal panicle of spikes but never a dense cluster, bracts usually green and never dark purple, native species except *J. brandegeana* 2

2a. Corolla small, < 15 mm long, spikes terminal or axillary, solitary or paired 3
2b. Corolla relatively large, at least 15 mm long; spikes usually aggregated into a terminal panicle of spikes although occasionally reduced to 1-2 spikes 12

3a. Spikes entirely axillary; bracts relatively small 4
3b. Spikes terminal and sometimes axillay as well; bracts > 10 mm long 6

4a. Bracts triangular-ovate, < 2 mm long ..... *J. laevilinguis*
4b. Bracts spathulate, 5-8 mm long 5

5a. Corolla 15-20 mm long; spikes one-sided ..... *J. corumbensis*
5b. Corolla < 10 mm long; spikes not 1-sided ..... *J. yuyoënsis*

6a. Spikes terminal only, solitary on each branch 7
6b. Spikes axillary as well as terminal, usually several on each branch 9

7a. Spikes rather short, < 4 cm long; bracts obtuse, very sparsely pilose ..... *J. longiacuminata*
7b. Spikes 3-10 cm long; bracts acuminate, densely pubescent or pilose 8

8a. Calyx 4-lobed; corolla white or yellowish ..... *J. yurimaguensis*
8b. Calyx 5-lobed; corolla pink ..... *J. mendax*

9a. Bracts obovate-spathulate, densely glandular-pilose ..... *J. obovata*
9b. Bracts ovate, elliptic or rhomboid, pubescent, pilose or ciliate but not glandular 10

10a. Calyx 4-lobed; spikes sessile ..... *J. dubiosa*
10b. Calyx 5-lobed; spikes pedunculate 11

11a. Bracts rhomboid, pubescent, acute; spikes distributed in leaf axils along stem ..... *J. rhomboidea*
11b. Bracts elliptic, pilose and ciliate, apiculate; spikes clustered in uppermost leaf axils ..... *J. pilosa*

12a. Bracts 10-25 mm long 13
12b. Bracts less than 10 mm long 20

13a. Bracts eglandular 14
13b. Bracts glandular, glands sessile or stalked 18

14a. Corolla white; bracts soft in texture, becoming reddish; cultivated species ..... *J. brandegeana*
14b. Corolla red; bracts stiff, somewhat membranous or green; native species 15

15a. Calyx 4-lobed; bracts strongly ciliate, green foliaceous ..... *J. ramulosa*

15b. Calyx 5-lobed; bracts glabrous, puberulent or (rarely) ciliate, membranous 16

16a. Bracts acuminate, finely pointed ..... *J. aequilabris* ssp. *riograndina*
16b. Bracts obtuse to acute, never drawn to to a fine point 17

17a. Bracts glabrous, obtuse ..... *J. aequilabris* ssp. *glabribracteata*
17b. Bracts ciliate, acute ..... *J. aequilabris* ssp. *aequilabris*

18a. Corolla yellow; bracts long-acuminate ..... *J. monopleurantha*
18b. Corolla orange-red or pink; bracts obtuse to acute, never long-acuminate 19

19a. Corolla pink, 25-45 mm long; bracts obovate to oblanceolate; inflorescence much-branched ..... *J. mesetarum*
19b. Corolla orange-red, 45-50 mm long; bracts oblong; inflorescence with 1-3 branches ..... *J. albadenia*

20a. Bracts linear-lanceolate, not more than 1 mm wide; corolla glabrous ..... *J. chacoënsis*
20b. Bracts ovate to ovate-elliptic, at least 2 mm wide; corolla pubescent or covered with sessile glands 21

21a. Bracts reddish-brown; corolla covered with sessile glands ..... *J. beckii*
21b. Bracts greenish; corolla pubescent with gland-tipped or eglandular trichomes 22

22a. Corolla < 15 mm long, creamy-white with purplish markings, pubescent with eglandular trichomes ..... *J. chapadensis*
22b. Corolla > 30 mm long, orange-red, pubescent with glandular trichomes ..... *J. oranensis*

Group D consists of species in which the flowers are arranged in many-flowered cymes, clusters or spikes, which are mostly only slightly longer than broad. In the few species where the clusters are somewhat elongate and spike-like, the bracts are linear and not readily distinguished from the calyx lobes.

Group D

1a. Floral bracts expanded and conspicuous, differing clearly from calyx lobes 2
1b. Floral bracts inconspicuous, linear, resembling calyx lobes 6

2a. Panicles (or clusters) solitary, terminal only 3
2b. Panicles (or clusters) several, axillary and terminal 5

3a. Inflorescence a large, dense and many-flowered head; bracts to 2 cm long; cultivated species ..... *J. carnea*
3b. Inflorescence a small, lax, few-flowered panicle; bracts < 1.5 cm long 4

4a. Bracts obovate, obtuse, glabrous, violet ..... *J. nodicaulis*
4b. Bracts oblong-elliptic, acuminate, glandular-pubescent, green ..... *J. oreadum*

5a. Bracts yellowish, 2.5-7 cm long; corolla 40-50 mm long, red ..... *J. appendiculata*
5b. Bracts green, 1.5-3 cm long; corolla 25-40 mm long, pink ..... *J. thunbergioides*

6a. Inflorescence of a small terminal panicle in which individual flowers are easily discerned ..... *J. calycina*
6b. Flowers arranged in dense clusters or spikes 7

7a. Corolla yellow, heads elongate ..... *J. umbricola*
7b. Corolla pink or red; heads not or only slightly elongate 8

8a. Flowers verticillate in axils of uppermost leaves ..... *J. rusbyi*
8b. Flowers subsessile or pedunculate, in axillary and/or terminal heads 9

9a. Corolla tube very slender and short, < 0.75 mm wide and < 20 mm long; one calyx lobe much smaller than other four ..... *J. hassleri*
9b. Corolla tube relatively stout, > 1.5 mm wide, > 25 mm long; all five calyx lobes subequal 10

10a. Heads or spikes few, arising in uppermost leaf axils only and often appearing terminal 11
10b. Heads or spikes many, clearly axillary as well as terminal 14

11a. Flower heads subsessile; bracts terminating in a bristle; corolla ca. 25 mm long ..... *J. squarrosa*
11b. Flower heads shortly pedunculate; bracts not terminating in a bristle; corolla > 30 mm long 12

12a. Corolla tube cylindrical, widened just below mouth ..... *J. riedeliana*
12b. Corolla tube cylindrical to about half way, then widened towards mouth 13

13a. Bracts ciliate; corolla ca. 35 mm long ..... *J. sprucei*
13b. Bracts glabrous; corolla 50-65 mm long ..... *J. miquelii*

14a. Corolla dark red, tube 20-30 mm long ..... *J. dumetorum*
14b. Corolla pink, tube 12-18 mm long ..... *J. squalida*

Group E consists of those species where the flowers arise in the axils of the upper leaves forming a terminal spike or raceme. The leaves are, in fact, leaf-like bracts which diminish in size upwards but are otherwise similar to the leaves. The flowers may be sessile or pedicillate, solitary or several. In many cases the axillary flowers are arranged in small, shortly pedunculate axillary cymes or spikes with small, leaf-like bracts and in several species this kind of inflorescence intergrades with that where the flowers are apparently axillary. Species in this group are more varied vegetatively and contain the only two lianas found in Bolivia (*J. mandonii* and *J. megalantha*) as well as several species which are clearly shrubs rather than herbs, notably the two species from the subpuno *J. tweediana* and *J. xylosteiodes*.

Group E

1a. Calyx > 2 cm long, glabrous; corolla 55-70 mm long; plant a liana ..... *J. megalantha*
1b. Calyx < 2 cm long, glabrous or pubescent; corolla < 55 mm long; herbs undershrubs or lianas 2

2a. Flowers solitary or clustered, sessile, in leaf axils or almost so 3
2b. Flowers pedicellate, or arranged in pedunculate heads or leafy axillary and terminal spikes 5

3a. Flowers in verticels in upper leaf axil ..... *J. rusbyi*
3b. Flowers solitary (rarely in pairs) in leaf axils 4

4a. Undershrubs with long, unbranched woody stems; leaves linear to narrowly oblong, < 4 cm long ..... *J. tweediana*
4b. Perennial herb, woody below, much branched; leaves ovate, largest 5-11 cm long ..... *J. thunbergioides*

5a. Flowers solitary, pedicillate in leaf axils and/or in small pedunculate axillary clusters (inflorescence clearly axillary) 6
5b. Flowers in terminal, leafy spikes or in short, leafy spikes from upper leaf axils (inflorescence essentially terminal) 9

6a. Inflorescence and leaves sticky-glandular, calyx 4-lobed ..... *J. adhaerens*
6b. Inflorescence and leaves eglandular; calyx 5-lobed 7

7a. Corolla bicolored red and yellow; plant puberulent to subglabrous; cultivated species ..... *J. floribunda*
7b. Corolla white or red; plant hirsute, native species 8

8a. Flowers white; herbs erect; inflorescence with long, pilose trichomes ..... *J. phyllocalyx*
8b. Flowers red; plant climbing; inflorescence pubescent ..... *J. mandonii*

9a. Calyx < 8 mm long 10
9b. Calyx > 15 mm long 11

10a. Calyx 5-lobed; corolla puberulent and gland-dotted ..... *J. xylosteiodes*
10b. Calyx 4-lobed; corolla puberulent but without gland dots ..... *J. ramulosa*

11a. Climbing shrub; inflorescence and capsule pubescent ..... *J. mandonii*
11b. Erect undershrubs; inflorescence usually glabrous; capsule glabrous 12

12a. Corolla 40-50 mm long, tube brownish; calyx lobes 3-5 mm wide ..... *J. consanguinea*
12b. Corolla 20-25 mm long, tube whitish; calyx lobes ca. 2 mm wide ..... *J. asclepiadea*

Justicia adhaerens Wassh. & J. R. I. Wood, Kew Bull. 58:809. 2004. TYPE: Bolivia, Santa Cruz, *J. R. I. Wood & K. Wendelberger 17229* (holotype K; isotypes CAS, LPB, UCZ, US-3442794).

Sticky, glandular-pilose perennial undershrub of bushy habit reaching ca. 60 cm in height; stems glabrous with brown bark below, sticky, glandular-pilose above; leaves petiolate, blades ovate, 1.5-5 x 2-4.5 cm, obtuse or obtuse and minutely apiculate at apex, densely sticky-glandular-pilose on both surfaces; inflorescence of 1-3-flowered, pedunculate, glandular-pilose, axillary cymes, sometimes reduced to a single flower; floral bracts oblanceolate, 5 x 0.75 mm; bracteoles linear, 3 mm long; calyx subequally 4-lobed, glandular-pilose; corolla 30-37 mm long, tube carmine with yellow, pilose veins from a yellow base, lips darker carmine with yellowish veins but variable in color, 16-24 mm long, upper lip 12-15 mm long, apically notched, lower lip 13-17 mm long. A very local Bolivian endemic known from a single locality in the Serrania de Santiago in eastern Bolivia where it grows at 550 m near streams in low scrub in campo rupestre vegetation on almost bare rock. Flowers from March to May.

Justicia aequilabris (Nees) Lindau, in Engl. & Prantl, Naturl. Pflanzenfam. IV. 3b:350. 1895; Ezcurra, Ann. Missouri Bot. Gard. 89:236. 2002. - *Orthotactus aequilabris* Nees, in Mart., Fl. Bras. 9(7):134. 1847. TYPE: Brazil, loco non accuratius indicato, *Sellow s.n.* (holotype B, destroyed; F photo 8902).

Justicia strobilacea (Nees) Lindau, in Engl. & Prantl, Naturl. Pflanzenfam. IV. 3b:350. 1895. - *Orthotactus strobilacea* Nees, in Mart., Fl. Bras. 9(7): 133. 1847. TYPE: Brazil, Bahia, *Blanchet 2575* (lectotype E, here chosen; isolectotype NY).

Climbing perennial herbs with woody base to 1 m high; stem 4-angled, apically puberulous; leaves petiolate, blades ovate, 7-9 x 2.5-3.5 cm, glabrescent, apically subacuminate, tip obtuse, attenuate at base; inflorescence of dense, terminal and axillary, pedunculate spikes, terminal spikes exceeding upper leaves; bracts imbricate, green, ovate, 20 x 10 mm, apically various, rounded to obtuse, acute to weakly cuspidate or terminating in a long, fine point, margins ciliolate to ciliate, membranaceous, conspicuously nerved, glabrous to pubescent; bracteoles 12 x 2.5 mm; calyx 5-lobed, lobes 7 x 0.75 mm; corolla red, 25-38 mm long, puberulous, tube 18-27 mm long, 4 mm in diam. at mouth, upper lip 9 mm long, entire, lobes of lower lip 7 x 2 mm; anther thecae superposed; capsule 12 x 4 x 3 mm; seeds dark brown, muricate.

Semi-deciduous forest edge and woodland on plain at elevations between 200 and 1900 meters.

We concur with Ezcurra (2002:236-7) that all the above names belong to a single species, *Justicia aequilabris*, which extends from the Rio Grande basin in Central Andean Bolivia to NE

Brazil and NE Paraguay. However, the Bolivian populations can be divided into three quite distinct subspecies, which are morphologically well-defined and geographically isolated. The three subspecies can be separated by the following key:

1a. Bracts rounded to obtuse at apex, glabrous ..... *J. a.* ssp. *glabribracteata*
1b. Bracts acute to apiculate, ciliolate, ciliate or pubescent 2

2a. Bracts terminating in a long, fine point, margins ciliolate ..... *J. a.* ssp. *riograndina*
2b. Bracts acute to weakly cuspidate, never terminating in a long fine point, often pubescent on veins and always ciliate on margins ..... *J. a.* ssp. *aequilabris*

Justicia aequilabris (Nees) Lindau ssp. **aequilabris**

This subspecies is distinguished by the ovate bracts which are distinctly ciliate on the margin and commonly pubescent on the veins. The tip varies from subacute to acute or somewhat cuspidate but is never drawn out into a long, fine point. This appears to be the only subspecies in Brazil and Paraguay and just enters Eastern Bolivia at Puerto Suarez on the border with Brazil [*Lankester s.n.* (K)]. It appears to be a plant of dry forest.

Justicia aequilabris (Nees) Lindau ssp. **glabribracteata** (Lindau) Wassh. & J. R. I. Wood, Kew Bull. 58:819. 2004. *Justicia glabribracteata* (Lindau) V. A. W. Graham, Kew Bull. 43:617. 1988. - *Jacobinia glabribracteata* Lindau, Bull. Herb. Boiss., ser. I, 3:486. 1895. TYPE: Bolivia, Santa Cruz, *Kuntze s.n.* (holotype B, destroyed; F photo 8906, isotype NY).

This subspecies is distinguished by its oblong-ovate, glabrous bracts which are rounded to obtuse at apex.

A local, endemic subspecies of seasonally moist, lowland forest between 400 and 750 m centered on Santa Cruz in Bolivia. Flowers mainly from March to June, slightly later than subsp. *riograndina*.

Specimens examined: SANTA CRUZ: Ñuflo de Chávez, *Mamani & Jardin 423* (K, UCZ); Ichilo, *Wasshausen et al. 2053* (CAS, CORD, GOET, LPB, US); Ibañez, *Wood 10989, 12459, 13741* (K, LPB, US); Florida, *Daniel et al. 10139* (CAS, K, LPB).

Justicia aequilabris (Nees) Lindau ssp. **riograndina** Wassh. & J. R. I. Wood, Kew Bull. 58:820. 2004. TYPE: Bolivia, Cochabamba, Campero, 5 km N of Puente Arce along road to Aiquile, 1900 m, 19 Mar 1994, *Wood 8129* (holotype K; isotype LPB, US-3342186).

This subspecies is distinguished by its ovate bracts which are gently acuminate and drawn out into a long, fine point. The margins are ciliolate.

Endemic to very dry bushland in the Río Grande valley systems of central Andean Bolivia and found from 1200-1900 m in elevation. Flowers from February to May, slightly earlier than subsp. *glabribracteata*.

Specimens examined: SANTA CRUZ: Caballero, *Brummitt et al. 19231* (K, LPB), *Wood 11730* (K, LPB); Vallegrande, *Wood 10643* (K, LPB). CHUQUISACA: Zudañez, *Wood & Serrano 13368* (K, LPB); Bueto, *Wood 10665* (K, US).

Justicia albadenia (Rusby) Wassh. & J. R. I. Wood, Kew Bull. 58:823. 2004. *Aphelandra albadenia* Rusby, Mem. New York Bot. Gard. 7:364. 1927. TYPE: Bolivia, BENI: Reyes, *Rusby 1125* (lectotype, NY, here chosen).

Erect perennial 1-2 m tall; stems subterete, slender with short internodes, younger stems strigose-puberulent, older glabrate; leaves petiolate, blades elliptic to ovate, 15-30 x 3-10 cm, glabrate, deep green on both surfaces, apically long-acuminate, attenuate at base, margin obscurely sinuate-crenate; inflorescence spicate, pedunculate, spikes terminal and axillary, very viscous, 7-11 x 1.5-2 cm, exceeding upper leaves; bracts oblong, 20 x 4-5 mm, green, densely glandular puberulent, apically long-acuminate, ciliate; bracteoles similar but smaller, 15 x 2-2.25 mm; calyx 5-lobed, lobes unequal, posterior

shorter, narrowly lanceolate, 14-15 x 2 mm, anterior and lateral pairs filiform, 15-16 x 0.75 mm, all densely ciliolate; corolla 45-50 mm long, glandular puberulent, orange to red, tube 25-30 mm long, apically 4-5 mm in diam., upper lip erect, 12-20 x 7-8 mm, apically obscurely bilobed, lower lip 20-22 x 7-10 mm, nearly equally 3-lobed, lobes elliptic; 5 x 3.5 mm; anther thecae superposed, unequal; capsule clavate, 15 x 4 x 3 mm, puberulous, stipe ca. half the length of capsule, 4-seeded; seeds suborbicular, 1.5 mm in diam. tuberculate.

A very locally frequent endemic species of moist tropical forest in the Andean foothills centered in Rurrenabague. Flowers in the dry season from July to September.

Specimens examined: Beni: Ballivián, *de Michel 1089* (LPB), *Kessler 10685* (LPB, US), *Wasshausen 2158* (CAS, K, LPB, NY, US), *2160* (CAS, GOET, K, LPB, NY). La Paz: Iturralde, *Serato 117* (US),*Kessler 11164* (LPB, US); Tamayo, *Helme 147* (LPB, US); Sud Yungas, *Wasshausen 2194* (CAS, GOET, K, LPB, NY).

Justicia appendiculata (Ruiz & Pav.) Vahl, Enum. Pl. 1:159. 1804. - *Dianthera appendiculata* Ruiz & Pav., Fl. Peruv. & Chil. Prodr. 1:12. pl. 11. 1798.

Beloperone appendiculata (Ruiz & Pav.) Nees, in DC. Prodr. 11:423. 1847. Type: Peru, Huánuco, Pozuzo, *Pavón s.n.* (holotype MA, not seen).

Beloperone denudata Nees in DC. Prodr. 11:423. 1847. Type: Peru, Loreto, Maynas, *Poeppig 2017 B* (B syntype, destroyed; F photo 8929; lectotype W, here chosen).

Beloperone mathewsiana Nees, in DC. Prodr. 11:731. 1847. Type: Peru, San Martín, Moyobamba, *Mathews 1535* (K holotype).

Perennial erect shrub 1-3 m, nearly glabrous; leaves conspicuously large, long-petiolate, elliptic, 11-28 x 6-13 cm, acute, dark-green above, glabrous; inflorescence of short, peduncled axillary and terminal spikes; bracts leaf-like, conspicuous, pale yellow, ovate, 25-70 x 10-35 mm; calyx 5-partite, 5-6 mm long, lobes subulate; corolla pink or salmon-colored, very slender, minutely puberulent, 40-50 mm long; anthers with 1 thecae slightly higher than other; capsule minutely puberulent, 20 mm long.

Widespread and locally frequent in moist forest in the SW Amazon basin of Peru, Brazil and Bolivia extending into the Andean foothills up to about 1200 m. Flowers in the dry season from May to September.

Specimens examined: Pando: Roman, *Solomon 17143* (MO); Munuripi, *Daly 2040* (K, MO, NY, US). Beni: Ballivián, *Wasshausen 2161* (K, LPB, US). La Paz: Guanay, *Rusby 1121* (NY, US); Huachi, *White 472* (K); Río Beni, *Rusby 1819* (NY, US); Sud Yungas, *Seidel 2154* (LPB, US), *2499* (LPB, US), *Wasshausen 2156, 2200* (K, LPB, US); Iturralde, *Helme 856* (LPB, US); *Serato AS0168* (US), *DeWalt 507* (US). Cochabamba: Chapare, *Wasshausen 2071* (CAS, GOET, K, LPB, US); Carrasco, *Wood 14908* (K, LPB, US). Santa Cruz: Ichilo, *Neill 9339* (MO, US); Yapacaní, *Daly 2105* (NY).

Justicia arcuata Wassh. & J. R. I. Wood, Kew Bull. 58:815. 2004. Type: Bolivia, Cochabamba, ca. 5 km from Cochabamba-Santa Cruz highway along road ascending E side of Río Ichoa, *J. R. I. Wood 15006* (holotype K; isotypes BOL, LPB, US-3442769).

Erect, much-branched, untidy herb, 0.75-1.2 m high; stem rounded, very swollen at the nodes; leaves petiolate, petioles 2-30 mm long, blades oblong-elliptic, (2-) 4.5-16 x (0.5-) 1.5-5 cm, attenuate at both ends, glabrous or with patent, white trichomes on margins; inflorescence a terminal panicle, primary branches bifurcating, the flowers arising opposite in sterile bracts or new branchlets; floral bracts 1 x 0.5 mm, triangular-ovate, minutely pilose; bracteoles similar; calyx subequally 5-lobed; corolla yellow-green, becoming curved around middle, 7-9 mm long, densely glandular with sessile glands without, tube ca. 2 mm wide, lips 4-5 mm long, upper lip entire, lower lip deflexed, 3-lobed, lobes 1 x 1 mm, ovate; anthers included; capsule 9-10 x 1.5 mm, broadly oblong with a narrowed sterile base.

Endemic to Bolivia occurring in a variety of disturbed bushy habitats derived from former moist forest along the eastern foothills of the Andes from the Santa Cruz area N to the Yungas of La Paz. It is found between around 200 and 800 m in scattered localities. Flowers from July to October, late in the dry season.

Specimens examined: La Paz: Sud Yungas/Beni: Ballivián, *Beck 12705* (LPB, US). La Paz: Sud Yungas, *Seidel 2076* (LPB, US); *Seidel & Vargas 2724* (LPB, US); *Seidel 4119* ((LPB, US). Cochabamba: Carrasco, *Wood 14923* (BOL, K, LPB, US); Chapare, *R. F. Steinbach 362* (US). Santa Cruz: Ichilo, *Solomon & Urcollo 14098* (MO, US); *Wood & Menacho 12673* (K, LPB); *Wood 14671* (K, LPB).

Justicia asclepiadea (Nees) Wassh. & C. Ezcurra, Candollea 52:172. 1997. - *Simonisia asclepiadea* Nees, in Mart., Fl. Bras. 9(7): 145. 1847. Type: Brazil, Mato Grosso, Serra da Chapada, *Riedel 1063* (holotype LE, isotype GZU).

Justicia alboreticulata Lindau, Bull. Herb. Boiss. ser. 2, 5:370. 1905. Type: Brazil, Mato Grosso, Serra da Chapada, *Malme 3449* (Syntype B, destroyed; F photo 8805).

Perennial herb with woody base; leaves petiolate, oblong-ovate, 5-8 x 2-3.5 cm, glabrate, basally rotundate; inflorescence of short, branching, pedunculate, axillary and terminal spikes, these ± equaling upper leaves; flowers alternate; bracts linear, 20 mm long; calyx 5-lobed, lobes 15 x 3-4 mm; corolla light blue-violet, sparingly glandular-puberulous, 18-24 mm long, tube 8-10 mm in diam. at mouth, upper lip 10-14 x 8-10 mm, apically shortly bilobed, lower lip 10-16 x 8-14 mm, palate somewhat rugulose; anther thecae superposed.

A very locally frequent plant of Campo Rupestre vegetation found on the Meseta de Huanchaca in Bolivia at around 7-800 m and in similar habitats in Mato Grosso in Brazil. Flowers from March to July.

Specimens examined: Santa Cruz: Velasco, *Killeen 5435* (MO, US, USZ), *Mostacedo 1442, 1742* (MO, US, USZ), *Peña 85, 87, 211* (MO, SCZ, US), *Jiménez 1270* (MO, US), *Wood et al. 18259* (K, LPB, US).

Justicia beckii Wassh. & J. R. I. Wood, Kew Bull. 58:820. 2004. Type: Bolivia, Caranavi, Caranavi-Guanay road, 2-3 km W of Caranavi, 600 m, 27 Jul 1998, *Wasshausen & J. R. I. Wood 2152* (holotype US-3455449; isotypes K, LPB). Fig. 16.

Shrub 1.5-2 m high; stems erect, dark green, minutely scurfy-puberulent; leaves petiolate, petioles 1.5-7.5 cm long, blades oblong-elliptic, 6.5-28 x 2.5-11 cm, attenuate at both ends, entire, ± glabrous; inflorescence a terminal panicle formed of shortly pedunculate spikes arising from the axils of uppermost leaves, spikes 3-18 cm long; flowers imbricate, peduncles 0.5-3 cm long, rufous-scurfy-puberulent, rhachis similar; bracts ovate to ovate-elliptic, obtuse, 3-7 x 2-3 mm, rufous-scurfy-pubescent; bracteoles lanceolate, 3 x 1 mm, rufous-scurfy-pubescent; corolla salmon-red or orange-red, covered with numerous sessile glands, 26-58 mm long, lips 7-10 mm long, upper lip entire, slightly hooded, lower lip spreading, lobes oblong-ovate, 1.5 x 1 mm.

A plant of scattered localities in the Andean foothills of Peru and northern Bolivia, growing in moist forest along shaded streams at elevations between 250 and 1100 m. Because of the vulnerability of this habitat to erosion from flash floods or forest clearance, this plant should be regarded as vulnerable or even threatened in the IUCN classification. Flowers in the dry season in July and August.

Specimens examined: Beni: Ballivián, *Beck 1693, 1694* (LPB, US). La Paz: Sud Yungas, San Bartolomé, *Krukoff 10457* (K, NY, US); Beck 8555 (US, LPB); Caranavi, *Wood & Wasshausen 13179* (K, LPB).

Justicia boliviana Rusby, Mem. Torrey Bot. Club 6:104. 1896. Type: Bolivia, Cochabamba, Chapare, Espiritu Santo, *Bang 1225* (holotype NY; isotypes K, US-1178190).

Justicia reisensis Rusby, Bull. Torrey Bot. Club 27:185. 1900. Type: Bolivia, Beni, Ballivián, Reis, *Rusby 1169* (holotype NY; isotype US-1320207).

Justicia cyanantha Lindau, Bull. Herb. Boiss.Ser. 2, 4:414. 1904. Type: Brazil, Amazonas, *Ule 6112* (isotype K).

Justicia camapuanensis Wassh., Dubs Prodr. Fl. Matogrossensis Ser. B, part 1:1. 1998. - *Rhytiglossa pauciflora* Nees, in Mart., Fl. Bras. 9(7):123. 1847. (non *Justicia pauciflora* Griseb. 1879). Type: Brazil, Mato Grosso, Camapuã, *Riedel 672* (holotype GZU; isotype LE).

Erect, perennial herb with leggy, glabrous stem to 1 m; leaves petiolate, blades lanceolate to ovate-

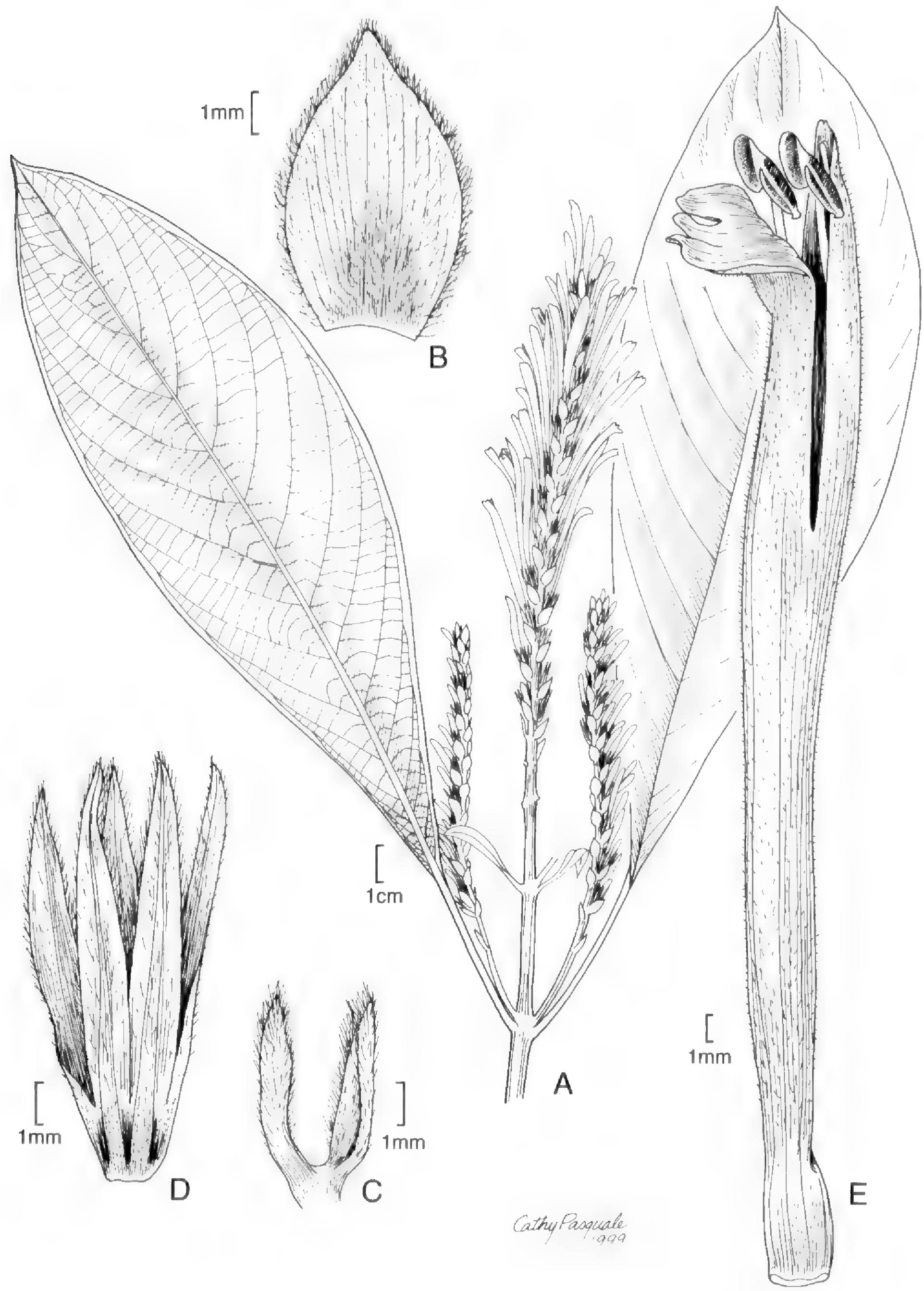


Fig. 16. *Justicia beckii*. A. Habit. B. Bract. C. Bracteoles. D. Calyx lobes. E. Corolla. (From *D. Wasshausen 2152*, US).

elliptic, 2.5-15 x 1.5-4.5 cm, paler beneath, glabrous or pubescent below, especially on veins, basally cuneate; inflorescence of pedunculate spikes, these commonly paired, to 18 cm long, these rather loosely flowered arising in upper leaf axils; bracts inconspicuous, linear-lanceolate, ca. 3 mm long; calyx 4-parted, 6-8 mm long, lobes linear-lanceolate, apically finely acute; corolla cream, white or white with faint mauve markings, 10-15 mm long, sparingly puberulous, tube straight, slightly contracted near middle, lower lip 6-8 mm long, middle lobe distinctly larger, upper lip somewhat shorter, entire, concave; anthers with thecae superposed; capsule 10 mm long, light brown; seeds ovoid, 2 mm long, light brown and muricate.

Justicia boliviana Rusby ssp. **boliviana**

This subspecies is distinguished by its leaves and inflorescence. The leaves are lanceolate to narrowly oblong-elliptic, typically about three times as long as broad and reaching 15 cm in length. They are usually glabrous beneath. The flower spikes are commonly paired, 5-18 cm long, relatively lax with flower pairs more than 0.5 cm apart and not truly imbricate even above. Our own observations suggest that the corolla is cream with violet markings but some of the field notes from Peru and Bolivia suggest that it is sometimes blue or at least pale violet.

It is the common subspecies in Bolivia north of 17°50' S and the only one known to occur in Peru and Brazil. It is characteristic of partial shade in relatively moist forest, often growing on steep banks and in stream gullies. It can be found in flower at any season but flowers intensively after the spring rains in November-December.

Specimens examined: Pando: Manuripi, *Solomon 10884* (MO, US). Beni: Yacuma, *Foster 12354* (LPB, US); Ballivián, *Rusby 1169* (K, NY); *Beck 8187* (LPB, NY, US), *16593* (LPB, US), *Solomon 14633* (MO, US), *Smith 12868* (LPB, MO, NY), *Kessler 10849* (LPB, US), *Balderrama 564* (US). La Paz: Caranavi, *Wasshausen 2142* (CAS, K, LPB, US); *Wood & Mondaca 14546* (K, LPB); Nor Yungas, Unduavi, *Rusby 1170* (NY, US); Larecaja, Mapiri Region, *Williams 740* (K, NY); San Carlos, *Buchtien 1354* (NY, US), *1355, 1356, 1357, 1358, 1358a, 1989* (US); Charopampa, *Buchtien 1461* (US); Isapuri, *White 740* (K). Cochabamba: Chapare, *Beck 7372* (LPB, US), Incachaca - S. Antonio, *Werdermann 2076* (MO); Villa Tunari, *Wood 8515* (K, US), *Wood 12918* (LPB, K); Carrasco, *Wasshausen 2064* (CAS, CORD, GOET, K, LPB, US), *Wood & Mamani 12778* (BOL, K, LPB, US). Santa Cruz: Velasco, *Killeen 5651* (MO, US, USZ), *Jardim & Chamos 139* (MO, US, USZ).

Justicia boliviana Rusby ssp.**subintegrifolia** (Rusby) Wassh. & J. R. I. Wood, Kew Bull. 58:773. 2004.

Justicia subintegrifolia Rusby, Bull. New York Bot. Gard. 4:430. 1907. Type: Bolivia, *Bang 2545* (holotype NY; isotypes K, US-32855).

This subspecies has ovate leaves, only about twice as long as broad and not exceeding 8 cm in length. The leaves are commonly pubescent beneath, at least on the veins. The flower spikes are always solitary, 3-12 cm in length and relatively dense with the flowers ± imbricate and less than 0.5 cm apart. This is the only subspecies occurring south of 17° S and occurs in small scattered colonies in relatively dry Tucuman-Bolivian forest and in wooded cerrado on the precambrian shield but also occurs sporadically further north in Bolivia, especially in the dry valleys of the Sud Yungas and Inquisivi. Like subspecies *boliviana* this subspecies flowers at any season but especially after the spring rains in November-December.

Specimens examined: Beni: Ballivián, *Croat et al. 84607* (MO, US). La Paz: Sud Yungas, *Kessler et al. 5785* (LPB, US), *Beck 12627* (LPB, US), *Schmidt 80* (LPB, US); Nor Yungas, *Buchtien 4019* (US); Inquisivi, *Beck & Bach 23256* (LPB, US). Pando: Suárez, Cobija, *Ule 9827* (K, UC). Santa Cruz: Ñuflo de Chávez, *Wood, Goyder & Mamani 13123* (K, LPB); *Wood 14343* (K, LPB, US); Velasco, *Sanchez et al. 347* (MO, US), *Garvizu & Carrion 222* (MO, US), *Rodriguez & Foster 722* (MO, US); Ichilo, *J. Steinbach 6202, 6943* (K, US), *Wood & Mamani 12809* (K, LPB); Florida, *Wood 8821* (K, LPB); Cordillera, *Wood, Goyder & Serrano 13237* (K, LPB), *Wood 14184* (K, LPB). Chuquisaca: Calvo, *Wood et al. 13276* (K, LPB, US); Boeto, *Wood 12737* (K, LPB); Tomina, *Wood 7966, 8453* (K, LPB), *Wood 8821* (K, LPB, US). Tarija: O'Connor, *Wood & Goyder 16815* (K, LPB).

Justicia boliviensis (Bremek.) V.A.W. Graham, Kew Bull. 43:613. 1988. - *Sarotheca boliviensis* Bremek., Proc. Konin. Nederl. Akad. Wetensch., s. C, 72, no. 4:427. 1969. Type: Bolivia, La Paz, Sud Yungas,

Chulumani, *Brooke 6548* (holotype BM, isotype NY).

Justicia viscosa V. A. W. Graham, Kew Bull. 43:614. 1988. - *Beloperone nuda* Rusby, Mem. Torrey Bot. Club 6:103. 1896, non *Justicia nuda* (Nees) O. Schwartz 1939. TYPE: Bolivia, La Paz, Larecaja, Mapiri, *Bang 1511* (holotype NY; isotypes BM, K, US-47709).

Jacobinia rusbyi Britton ex Rusby, Bull. Torrey Bot. Club. 27:79. 1900, non *Justicia rusbyi* (Lindau) V. A. W. Graham 1988. - TYPE: Bolivia, La Paz, Yungas, *Rusby 2404* (holotype NY; photo US).

Perennial herb, stems slightly woody below, pilose, ascending or erect to 1 m; leaves petiolate, blades elliptic, 10-24 x 3.5-7.5 cm, pilose, especially below, tapering at both ends; inflorescence of long-pedunculate, glandular-pilose, viscid panicles of short leafless spikes, these terminal or from uppermost leaf axils; bracts minute, linear, ca. 2 mm long; calyx 5-parted, 8-9 mm long, lobes linear-lanceolate, acute; corolla pale-yellow, 25-55 cm long, glandular-pilose, lower lip bent down at right angles to upper lip, shallowly 3-lobed; anther thecae diagonally superposed; capsule glandular-pilose, 15-17 mm long.

Endemic to Bolivia and locally abundant in disturbed bushy ground in the Sud Yungas and Nor Yungas provincias, becoming sporadic and rare outside this area, mostly growing between 900 and 2000 m. Flowers in the dry season from May to September.

Specimens examined: BENI: Ballivián, *Beck 6992* (LPB, US), *Fournet 540* (US), *Kessler 10840* (LPB, US). LA PAZ: Saavedra, *Wood & Wasshausen 16665* (K, LPB); Sud Yungas, Cataracts of Río Bopi, *Rusby 705* (NY); *Beck 8538, 16887* (LPB, US), *Schmit 67* (LPB, US), *Acevedo 4449* (NY, US), *Wood 8598* (K, US); Caranavi, *Wasshausen 2096* (CAS, CORD, GOET, LPB, US), *Solomon 12484, 15661* (MO, US), *Brummitt & Wasshausen 1943* (K, US); Nor Yungas, Coroico, *Buchtien 5785* (BM, US), *Beck 8347, 17630* (LPB, US), *9201* (LPB, NY, US), *Brooke 6630* (BM), below Coroico, *Solomon 15661* (MO, US), *Croat 51581, 51669* (MO); Yolosa, *Solomon 8572* (MO, NY, US), *12484, 18424* (MO, US); Larecaja, *Kessler 4417* (LPB, US); Mapiri, *Buchtien 1366, 1470, 1951* (US), Guanai, *Williams 1596* (K, NY, US); Inquisivi, *Lewis 40227* (LPB, MO, US); Canamina, *Rusby 48* (K). COCHABAMBA: Tiraque, *Wood 12405* (K, LPB). SANTA CRUZ: Caballero, *Balcazar & Delgadillo 844* (UCZ, US); Florida, *Vargas 452* (K, UCZ). WITHOUT PRECISE LOCALITY: *Bang 2303* (K, MO, NY, US).

Justicia brandegeana Wassh. & Smith, "Acanthaceae". Flora Ilustrada Catarinense. fasc. ACAN. 102. 1969. - *Beloperone guttata* Brandegee, Univ. Calif. Publ. Bot. 4:278. 1912, non *Justicia guttata* Wall. 1830 - *Calliaspidia guttata* (Brandegee) Bremek., Verhand. Konin. Nederl. Akad. Wetensch., Afd. Natuurk., Tweede sect. 45:54. 1948. TYPE: Mexico, San Luis Potosí, *Purpus 5263* (holotype UC).

Undershrub 0.5-2 m high, stems dark green, bifariously pubescent; leaves shortly petioled, 1.5-7 x 0.8-3 cm, softly pubescent beneath, acute or obtuse; inflorescence of terminal bracteate spikes 3-8 cm long; bracts ovate, green when young, becoming wine-red when old, 17-25 x 10-15 mm, shortly tomentose, apically acute; bracteoles broadly lanceolate to elliptic, 8-13 x 5 mm; calyx 5 mm long, pilose, 5-lobed, lobes subulate, scarious; corolla white, very narrow, ca. 30 mm long, pilose, strongly 2-lipped to half its length; anther thecae obliquely superposed.

Introduced species (shrimp plant) from Mexico, commonly cultivated in tropical gardens in Bolivia, especially in and around Santa Cruz.

Justicia calycina (Nees) V. A. W. Graham, Kew Bull. 43:610. 1988. - *Beloperone calycina* Nees in London J. Bot. 4:637. 1845. - *Dianthera calycina* (Nees) Benth. ex B. D. Jacks., Index Kewensis, 1: 742. 1893. - *Rhacodiscus calycinus* (Nees) Bremek., Verhand. Konin. Nederl. Akad. Wetensch., Afd. Natuurk., Tweede sect. 45:53. 1948. TYPE: Guyana, *Schomburgk s.n.* (holotype K).

Sericographis acuminata Nees, in Mart. Fl. Bras. 9(7):109. 1847. TYPE: Brazil, Rio Negro, *Martius s.n.* (holotype M; isotype GZU).

Rhytiglossa acuminatissima Miq., Stirp. Surinam. Select. 129. 1850. - *Rhacodiscus acuminatissimus* (Miq.) Lindau, in Engl. & Prantl, Nat. Pflanzenfam. 4(3b):308. 1897. - *Dianthera acuminatissima* (Miq.) Benoist, Bull. Soc. Bot. France 68:321. 1921. - *Justicia acuminatissima* (Miq.) Bremek., Meded. Bot. Mus. Herb. Rijks Univ. Utrecht, 47:166. 1938.

TYPE: Surinam, *Hostmann 1112* (isosyntypes BM, K); *Kappler 819a* (isosyntypes C, G).

Erect herbs 80-100 cm, shoots with decumbent rooting base; leaves sometimes ternate, sessile, lanceolate, 18-36 x 5.5-7 cm, glabrate or puberulous beneath on veins, caudate at base; flowers borne secund in spike-like racemes, the latter in a large, rather dense panicle; peduncles 12-18 cm long; floral bracts and bracteoles triangular, 1.5 x 0.6 mm; calyx 5-lobed, subglabrous or puberulous, lobes linear and tapering into a point, 15-17 x 1 mm; corolla brick red, tubiform 50-60 mm long, glabrous, lips 20 mm long, upper bilobed; anther thecae unequal, subopposite, the lower shortly apiculate at base; capsule glabrous, 14 mm long, the stipe 8 mm long, the valves slightly sulcate at back; seeds ovoid, 3.2 x 2.8 mm, margin fringed with short triangular scales.

Widely distributed in the Amazon region on rocky river margins in partial shade, river margins.

Specimens examined: PANDO: Román, *Solomon 17115* (LPB, MO); Abuná, *Vargas 694* (LPB); Nicolás Suárez, *Fernández 8196* (NY); Manuripi, *Fernández 8532* (MO). BENI: Vaca Díez, *Krapovickas 35166* (CTES, MO, US); *Solomon 6187* (NY, MO, US), *7791* (MO), *7813* (MO, US); *Anderson 12043* (MO, NY, US). SANTA CRUZ: Velasco, *Wood et al. 16571* (K, LPB, US); *Quevedo 2629* (US, USZ); *Wasshausen & Wood 2249* (CAS, GOET, K, LPB, NY, US).

Justicia carnea Lindl., Edward's Bot. Reg. 17: pl. 1397. 1831. TYPE: A cultivated plant, originally introduced from Rio de Janeiro, Brazil.

Herbs or suffrutescent plants to 2 m high; stems subquadrangular, grooved, glabrous or minutely puberulous; leaves large, membranous, petiolate, blades oblong-ovate, to 25 x 7 cm, sparingly or inconspicuously hirtellous or puberulous, apically acuminate, basally acute to rounded and decurrent on petiole; inflorescence a solitary, terminal, dense, sessile or subsessile thyrse, to 19 cm long and 8 cm broad, rachis puberulous, lowermost thyrsulas often subtended by small leaf blades, upper thyrsulas subtended by elliptic bracts 20 x 10 mm (these reduced in size towards tip of thyrse), obtuse or rounded, moderately firm, glabrous or sparingly hirtellous, sparingly ciliate; bracts subtending flowers oblong, 20 x 15 mm, rounded at tip, glabrous and ciliate; bracteoles lanceolate, 15 x 1.5 mm; calyx lobes 5, lanceolate, 10 x 2 m, subhyaline, glabrous or sparingly hirtellous and ciliate near tip; corollas lilac, red or pink, sparingly glandular-puberulous, 65 mm long, tube 25 mm long, gradually enlarged from base, 5 mm wide at throat, upper lip erect, arched and bilobed at tip, lobes 1 x 0.75 mm, lower lip spreading or recurved, 3-lobed, cuneate, 8 mm wide at base of lobes, these ovate, 3 x 2 mm; anther thecae slightly superposed; capsule wanting.

Cultivated plants of this species are sometimes found in gardens in temperate areas such as Cochabamba.

Justicia chacoënsis Wassh. & C. Ezcurra, Candollea 52:178. 1997 - *Beloperone riparia* S. Moore, Trans. Linn. Soc. Ser. II, Bot. 4:432. 1895. TYPE: Brazil, Mato Grosso, Corumba, *S. Moore 1047* (holotype BM; F photo 8944).

Perennial low shrub 0.8-1 m; stem whitish or dark gray, subquadrate, striate, lower portion aphyllous; leaves petiolate, ovate to elliptic, 5-11 x 2.5-4.5 cm, slightly membranous, darker green and puberulous underneath, long-acuminate at both ends; inflorescence black when dry, axillary and terminal pedunculate spikes exceeding upper leaves, peduncles short, stout, spikes clustered, 5-10 cm long, peduncles ca. 5 mm long; bracts short, linear-lanceolate, 8 x 1 mm, exceeding calyx; bracteoles linear-subulate, equaling calyx; calyx 5-lobed, lobes subequal, narrowly linear-lanceolate, 4 mm long; corolla purple with white markings in throat, 35 mm long, glabrate, tube ca. 10 mm long, erect, limb subequal, upwards gradually and slightly enlarged, upper lip erect, lanceolate, entire, middle lobe of lower lip 2 times wider than lateral lobes, all erect; anther thecae distinctly superposed; capsule brownish, 12-14 mm long.

A locally frequent species of the north eastern Chaco just entering Bolivia around Puerto Suarez. Flowers in the winter dry season.

Specimens examined: SANTA CRUZ: German Busch, Puerto Suárez, *Lankester s.n.* (K, US), *Ritter 4225* (NHA, US).

Justicia chapadensis S. Moore, Trans. Linn. Soc. Ser. 2.4:431. 1895. TYPE: Brazil, Mato Grosso, Serra da Chapada, *S. Moore 199* (holotype BM, F photo 8816).

Ascending herb 0.5-1 m tall; stem leafy, subterete, yellowish-green, glabrate with swollen nodes; leaves petiolate, blades grey-green, lanceolate, 7-12 x 3-4 cm, firm, membranaceous-coriaceous, glabrate on both surfaces, apically acute or obtuse, gradually narrowed and attenuate basally, margin entire or obscurely undulate, secondary veins 8-10 pair, slightly curved, parallel at margin; inflorescence spicate, spikes axillary and terminal, pedunculate, 2-2.5 cm long, peduncles 10-15 mm long, upper subsessile; bracts ovate, 5-8 x 3-4 mm, green, uninerved, firm, hirsute and sparingly glandular pubescent, apically acute-mucronulate; bracteoles elliptic, 5-7 x 1 mm, pubescence similar to that of bracts; calyx 5-lobed, lobes narrowly linear, unequal, posterior somewhat shorter and wider, 5 mm long, anterior and lateral 6 mm long, all hirsute and sparingly glandular pubescent; corolla white and purplish-blotched or cream with mauve markings, 13 mm long, pubescent, tube 5 mm long, 2 mm wide at base, 3.5-4 mm wide at mouth, upper lip erect, 7 mm long, slightly shorter than lower lip, apically bilobed, lobes 0.5 x 0.5 mm, lower lip 7 x 8-13 mm, 3-lobed, lobes erect to spreading, obtuse, middle 2.5 x 3 mm, lateral 2 x 2 mm; anther thecae superposed, unequal, lower thecae larger.

A very rarely collected species of seasonally dry chiquitano forest known from the San Javier region in Bolivia and Mato Grosso in Brazil. Possibly vulnerable in the IUCN classification but possibly undercollected. Flowers in the winter dry season from July to September.

Specimens examined: SANTA CRUZ: Ñuflo de Chavez, *Wood 12560* (K, US), *12567* (K, LPB).

Justicia chapareënsis Wassh. & J. R. I. Wood, Kew Bull. 58:774. 2004. TYPE: Bolivia, Cochabamba, on road above El Palmar, 700-1300 m, 6 Jul 1997, *J. R. I. Wood 12406* (holotype K, isotypes BOL, LPB, US-3442810).

Perennial herb; stems decumbent and rooting at the nodes but finally ascending to 30 (-60) cm; leaves petiolate, petioles 3-15 mm long, blades lanceolate or oblong-lanceolate, 3-5 x 0.75-4 cm, glabrous except for a few, short, stiff trichomes on margins and veins; inflorescence of solitary, terminals spikes 2-13 cm long, these subsessile with peduncle 0-3 cm long, rhachis glandular-pubescent, flowers in opposite pairs, to 1.5 cm apart below becoming denser above; bracts subulate, 4-6 mm long, white-pilose with scattered, stalked glands; bracteoles similar to the bracts but 3-5 mm long; calyx 4-6 mm long, 4-lobed, lobes similar to bracts in shape and indumentum; corolla 16-18 mm long, glabrous within, tube cylindrical, pale cream, 8-11 mm long, glabrous or sparsely pubescent, lips violet glabrous within, cream-colored, pubescent without, upper lip truncate, ca. 6 mm long, lobes of lower lip ovate, ca. 2.5 x 2 mm; capsule ± clavate, 11-15 x 2-3 mm, glandular-pubescent.

Justicia chapareënsis grows in scattered colonies, often around rock outcrops in very moist tropical forest between 350 and 1400 meters on the Andean escarpment above the town of Villa Tunari in the wettest area in Bolivia. It appears to flower at the onset of the relatively dry winter season from May to July. It is endemic to Bolivia and is perhaps vulnerable in the IUCN classification.

Specimens examined: COCHABAMBA: Tiraque, *Kessler et al. 7783* (LPB, US), *Wasshausen 2069* (K, LPB, US), *Wood 8510, 13656* (K, LPB, US), *Wood et al. 11209* (K, LPB).

Justicia chuquisacensis Wassh. & J. R. I. Wood, Kew Bull. 58:785. 2004. TYPE: Bolivia, Chuquisaca, Boeto, 1 km N of Nuevo Mundo near the lake, 2000 m, 19 Oct 1997, *Wood 12728* (holotype K; isotypes HSB, LPB, US-3442796).

Gregarious herb with short, perennial, underground rhizomes from which arise erect, annual stems; stems pilose, to 25 cm high; leaves shortly petiolate, petioles 2-4 mm long, pilose; blades ovate, 0.8-3.6 x 0.7-1.7 cm, acute apically, sparsely to densely pilose especially on margins and veins; inflorescence of short, terminal spikes, these 1-4 cm long, elongating to 6 cm in fruit; flowers in opposite pairs, imbricate; bracts linear-subulate, 3 x 1 mm; bracteoles similar but with a narrower base; calyx 4-lobed, pilose, lobes linear-lanceolate; corolla deep pink, 9-10.5 mm long,

minutely pubescent on exterior of the lips, tube ca. 7 mm long, gradually widened to 4 mm at mouth, upper lip ca. 4.5 mm long, notched, lower lip 5-6 mm long, lobes ovate, 2.5-3 x 3 mm; anthers included; capsule 7 x 1.5 mm, clavate with a sterile base, glabrous.

A local but possibly overlooked endemic species of earthy banks in open scrub and on field borders growing between 2000 and 2675 m in the northern part of the Tucuman-Bolivian forest belt amidst patches of *Podocarpus*_forest.

Specimens examined: SANTA CRUZ: Caballero, *Wood & Mendoza 19080* (K, LPB, UCZ); Vallegrande, *Nee 40311* (LPB, NY), *Wood & Goyder 15613* (LPB). CHUQUISACA: Boeto, *Serrano 1134, 1159, 1203* (HSB), *Wood 10173* (K, LPB, US); Tomina, *Wood 8793* (K, LPB, US).

Justicia comata (L.) Lam., Encycl. 1:632. 1785. - *Dianthera comata* L., Syst. Nat. ed. 10. 850. 1759. - *Leptostachya comata* (L.) Nees, in A. DC. Prodr. 11:381. 1847. - *Ecbolium comatum* (L.) Kuntze, Revis. Gen. Pl. 2:487. 1891. - *Stethoma comata* (L.) Britton, Bot. Porto Rico 6:218. 1925. - *Psacadocalymma comatum* Bremek., Verhand. Konin. Nederl. Akad. Wetensch., Afd. Natuurk., Tweede Sect. 45:55. 1948. TYPE: Jamaica, Linn. Herb. 29:2, *P. Browne* (LINN, microfiche).

Leptostachya parviflora Nees, in Mart. Fl. Bras. 9(7):151. 1847. - *Justicia parviflora* (Nees) Lindau, in Engl. & Prantl, Nat. Pflanzenfam. 4(3b):350. 1897. TYPE: Brazil, Bahia, Ilhéos, *Max. Neuwied s.n.* (lectotype BR, here chosen).

Erect to spreading to decumbent annual or perennial, often somewhat aquatic herbs to 1 m; leaves sessile to petiolate, narrowly ovate to lanceolate, 2.5-6 (16) x 0.7-3.5 (4) cm, glabrous to sparsely pubescent, apically acuminate, basally attenuate to truncate to cordate-auriculate; inflorescence axillary and terminal, flowers secund, 1 per axil in slender or branched spikes, spikes forming in aggregate a terminal panicle, these to 25 cm long, branches of inflorescence very slender and almost filiform; bracts subtending flowers minute, subulate to triangular-subulate, 0.8-2.2 (5) x 0.3-0.5 mm, bracteoles similar; calyx 5-lobed, 1.5-4 mm long, lobes narrowly lanceolate to subulate, equal; corolla white, lilac, light blue, purplish-white often marked with maroon markings on lip, 3-7 mm long, glabrate, tube cylindric, 1-2 mm long, upper lip erect, emarginate, lower lip spreading; anther thecae purple, unequal, subparallel to perpendicular; capsule 3-5 x 2 x 1 mm; seeds reddish brown, 0.9-1.3 x 0.9-1.2 mm, covered with papillae.

Growing at low elevations on flat, sandy plains in moist areas, usually in somewhat degenerate forests. Common throughout South America but in Bolivia mostly in the Andean foothills and adjacent swampy plains.

Specimens examined: BENI: Vaca Díez, *Solomon 16754* (MO, US); Ballivián, *Beck 5379, 8191, 12209* (LPB, US); Cercado, Trinidad, *Krapovickas 35015* (CTES, MO). LA PAZ: Larecaja, Mapiri, *Rusby 2470* (NY); Caranavi, *Wood & Mondaca 14557* (K, LPB). COCHABAMBA: Tiraque, *Wood s.n.* (LPB, K). SANTA CRUZ: Ichilo, *Kuntze s.n.* (NY, US); *J. Steinbach 5290* (MO, US), *7321, 7488a* (BM, K, MO); *Beck 6596* (LPB, US); *Wood 16097* (K, LPB); Chiquitos, *Mamani 1349* (MO, US); *Wood & Mamani 13491* (K, LPB); Warnes, *Wood 9807* (K, LPB, US); Ibáñez, *Nee 34323* (NY, US); *Wood 13401* (K, LPB); Cordillera, *Peredo 58, 204, 375* (LIL, NY); Yapacaní, *Kuntze s.n.* (NY, US); Izozog-Chaco, *Cárdenas 6210* (US). CHUQUISACA: Calvo, *Saravia 11835* (CTES, US). WITHOUT PRECISE LOCALITY: Bolivia, *Bridges s.n.* (BM).

Justicia consanguinea (Lindau) Wassh. & C. Ezcurra, Candollea 52:174. 1997. - *Beloperone consanquinea* Lindau, Bull. Herb. Boiss. ser. 1, 5:676. 1897. TYPE: Bolivia, *Mandon 298* pro parte (holotype B, destroyed; F photo 8927; isotypes BM, G, K, P).

Glabrous undershrub 0.5-2 m high, stems woody, often spreading; leaves shortly petiolate, lanceolate to ovate, 2-3.5 x 1-2 cm, apically obtuse to acute; inflorescence of short terminal spikes, sometimes subcapitate; bracts ovate, ca. 15 mm long; bracteoles linear-lanceolate; calyx 5-lobed, 15-17 mm long, lobes pale green, lanceolate-acuminate; corolla 40-55 mm long, tube brownish, upper lip pink-tipped, notched, lower lip deflexed, pink; anthers with thecae inserted at same height; capsule glabrous, ca. 20 mm long.

Locally frequent endemic species restricted to the Inter-Andean Rio Grande catchment area, growing on steep well drained slopes covered with dry, semi-deciduous forest or spiny bushland at elevations between 1300 and 2600 meters.

Specimens examined: COCHABAMBA; Quillacollo, *Beck 870* (LPB, US); Mizque, *R. Steinbach 705* (LPB, MO, US), *Wood 13025* (K, LPB, US); Río Caine, *Cárdenas 2428* (US) Region de La Cabaña, *Adolfo 219g* (US); Campero, *Saravia & López 47, 882* (BOLV, US), *Saravia 578* (MO); Capinota, *Wood 14702* (K, LPB, US). SANTA CRUZ: Caballero, *Schmitt 60* (MO, US), *Solomon 15955* (MO), *Herzog 1806, 1806a* (L); Vallegrande, *Nee & Solomon 36582* (NY, US). CHUQUISACA: Zudañez, *Wood & Serrano 13355* (K, LPB, US). POTOSI: Charcas, *Mostacedo 321* (MO); Mollevillque, *Cárdenas 5883* (US). WITHOUT PRECISE LOCALITY: Bolivia, *Bridges s.n.* (BM); *D'Orbigny 1288* (P); *Mandon 297* pro parte (B, destroyed; P).

Justicia consanguinea var. **pubescens** (Lindau) Wassh. & C. Ezcurra, Candollea 52:174. 1997. - *Beloperone consanguinea* Lindau var. *pubescens* Lindau in Bull. Herb. Boiss. ser. 1, 5:676. 1897. TYPE: Bolivia, *Mandon 297* pro parte (syntype B, destroyed; F photo 8936; isosyntypes BM, G, K, P).

Separated from var. *consanguinea* by its general pubescence.

Specimens examined: SANTA CRUZ: Caballero, *Wood 10536* (K, LPB, US). UNKNOWN LOCALITY: *Mandon 298* (P).

Justicia corumbensis (Lindau) Wassh. & C. Ezcurra, Candollea 52:178. 1997. - *Beloperone corumbensis* Lindau, Bull. Herb. Boiss. ser. 2, 5:373. 1905. TYPE: Brazil, Mato Grosso, Corumbá, *Malme 3029* (holotype B, destroyed; F photo 8928; isotype S).

Justicia jujuyensis C. Ezcurra, Bol. Soc. Argent. Bot. 25:350. 1988.

Justicia leonardii DeMarco & Ruiz, Publ. Especial Inst. Lillo 50. 1976, non *Justicia leonardii* Wassh. 1973. TYPE: Argentina, Jujuy, *Legname & Cuezzo 5970C* (holotype LIL).

Justicia nemoralis Lillo, Lilloa 1:58. 1937, nom. nud., non *Justicia nemoralis* Sp. Moore 1909.

Justicia nemoralis Lillo var. *tomentosa* Lillo, Lilloa 1:59, lam. 3. 1937.

Undershrub 0.7-1.2 m; stem erect, terete, glabrous; leaves petiolate, oblong-ovate, 8-17 x 3-7 cm, glabrate, acuminate at both ends; spikes 1-2, axillary, unbranched or branched, about half as long as upper leaves, pedunculate; flowers secund, lax; bracts narrowly spathulate, 6 x 2 mm, sparingly pilose, apically mucronulate; bracteoles similar, equal to bracts in length; calyx 3 mm long, 5-lobed, lobes 2 x 1 mm, sparingly pilose; corolla white or white with purplish veins, 15-20 mm long, glabrous, tube 6 mm long, 3 mm in diam. at mouth, upper lip 8 x 7 mm, bilobed, lower lip 8 x 8 mm; anther thecae attached unequally to connective; capsule brownish, 8-10 x 4 x 3-3.5 mm, glabrous; seeds reddish. Preserved plants almost always dry dark.

Justicia corumbensis is locally common in Bosque Serrano Chaqueno and Chaco forest in SW Brazil, Paraguay, northern Argentina and Bolivia. It flowers from January to April during the summer rains.

Specimens examined: COCHABAMBA: Campero, *Antezana 604* (US). SANTA CRUZ: Ñuflo de Chávez, *Fuentes 1536* (MO, US), *Mamani 575* (US, USZ); Chiquitos, *Abbott 15900* (BEREA, US, USZ), *Mamani 1436* (MO, US), *Wood & Mamani 13415* (K, LPB, US); Guariri - Cordillera, *Cárdenas 4685* (BOLV, US); Cordillera, *Beck 6489* (LPB, NY, US), *Peredo 458* (NY), *466* (LIL, NY, US), *s.n.* (LIL, US), *Wood et al. 13236* (K, US), *Jardim 1560* (US, USZ), *Nee 48499, 48663* (NY, US); Sarah, *Menacho 697* (US, USZ); Andrés Ibáñez, *Nee 44840, 48443, 48730* (NY, US); Florida, *Jardim 344* (US, USZ), *Wood & Goyder 15636* (K, LPB, US). CHUQUISACA: Tomina, *Wood 9092* (K, LPB, US); Siles, *Beck 6393* (LPB, US), *Munoz 87z, 88z* (US); Calvo, *Saravia 11399* (CTES, US); *Wood, Goyder & Serrano 13279* (K, LPB). TARIJA: Gran Chaco, Tatarenda, *Fries 1555* (S, US), Gerold 261 (LPB, US); *Wood & Goyder 16825* (K, LPB).

Justicia cuzcoensis Lindau, Engl. Bot. Jahrb. 37:643. 1906. TYPE: Peru, Cuzco, Convencion, *Weberbauer 5060* (holotype B, destroyed; F photo 8819).

Shrub 1 m tall, branches glabrous, pilose at nodes; leaves petiolate, oblong, 6-9 x 2.5-4 cm, both upper and lower surfaces sparingly pilose, gradually narrowed at both ends; inflorescence axillary, long pedunculate, thyrsoid, di- or trichotomous, terminal branches spicate, very lax, spreading, overtopping branchlets, peduncles pilose; bracts and bracteoles linear, 3 and 1.5 mm long respectively, sparingly pilose or glabrate; flowers sessile; calyx 5-lobed, lobes linear, 3-3.5 x 1 mm, glabrous; corolla yellowish-white with violet markings on the lower lip, 14-15 mm long,

tube 7 mm long, basally 2 mm wide, 5 mm in diam. at mouth, upper lip whitish, 11 mm long, 8 mm wide at middle, apically shortly bifid, lower lip whitish with violet margins, 10 mm long, 8 mm wide at middle, lobes 2 mm long, lateral 2.5 mm wide, middle 3 mm wide, palate rugulose; anther thecae superposed, ± equal, connective broad; capsule 8-10 x 2.5 x 2 mm, glabrous.

A plant of the Amazon basin in SE Peru and northern Bolivia.

Specimens examined: PANDO: Manuripi, *Prescott 26* (MO).

Justicia dryadum Wassh. & J. R. I. Wood, Kew Bull. 58:813. 2004. TYPE: Bolivia, Sud Yungas, *Wasshausen & J. R. I. Wood 2196* (holotype US-3455450; isotypes K, LPB).

Perennial herb; stems at first decumbent, then erect and reaching 1 m, sulcate, bifariously pilose, glabrescent below; leaves petiolate, petioles 3-20 mm long, blades oblong-elliptic or obovate-oblong, acuminate, falcate, (2-) 6-16 x (1-) 2-8.5 cm, pilose on both surfaces; inflorescence a large terminal panicle to 25 cm long and 20 cm wide; flowers arranged in pairs or arising opposite the ultimate branchlets; floral bracts linear-lanceolate, ca. 1 mm long, glandular-pilose; bracteoles similar, ca. 0.5 mm long; calyx subequally 5-lobed; corolla glabrous except for a few trichomes on exterior of lips, ca. 11 mm long, tube pale cream, ca. 1.5 mm wide at base, upper lip ca. 3.5 mm long, entire, lower lip ca. 4 mm long, lobes 1.5 x 1 mm, ovate, middle lobe larger, purplish except for distinct nectar guides; anther thecae violet; capsule 8.5-10 x 2-2.5 mm, glandular-pilose; seeds minutely pustular.

Locally frequent in moist subtropical forest in the Andean foothills NE of La Paz between 300-700 m and flowering in the winter dry season. Endemic to Bolivia.

Specimens examined: LA PAZ: Tamayo, *Beck & Foster 18477* (LPB, US); Caranavi, *Kessler et al. 11310* (LPB, US); Sud Yungas, *Seidel & Vargas 2156* (LPB, US); *Seidel & Schulte 2501* (LPB, US); *Wood & Wasshausen 13888* (K, LPB, US); Iturralde, *Wasshausen & Wood 2178* (K, LPB, US); *Wood & Wasshausen 13844* (K, LPB, US).

Justicia dubiosa Lindau, Bull. Herb. Boiss., ser. II, 4:413. 1904. TYPE: Brazil, Amazonas, Jurua Miry, *Ule 5852* (holotype B, destroyed; lectotype HBG, here chosen).

Herb to 0.5 m, unbranched, stem bifariously pubescent; leaves petiolate, oblong, 8-11 x 3-4.5 cm, glabrous above, veins appressed pubescent below, acuminate at both ends; inflorescence of erect, dense, terminal pedunculate spikes; bracts imbricate, ovate, 10 x 4 mm, acuminate; bracteoles lanceolate, 4-5 x 1 mm, pubescent; calyx 4-lobed, lobes 3 x 0.75 mm, puberulous; corolla white and dotted purple in throat, sparingly pilose, 10-12 mm long, tube cylindric, 7 mm long, upper lip 5 mm long, entire, lower lip 5 x 4 mm, palate rugulose; anther thecae superposed, unequal; capsule 6-7 x 3 x 2 mm, puberulent.

Semi-deciduous gallery along lowland rivers in the Amazonian region.

Specimens examined: PANDO: Madre de Dios, *Rueda 949* (MO, US). BENI: Iténez, *Black 52-14921* (US). SANTA CRUZ: Velasco, *Nee 41418* (NY, US), *Saldias 2911* (MO, US, USZ), *Ritter 4397* (NHA, US), *Guillén 4110* (US, USZ), *L. Arroyo 781, 1348* (MO, US), *Nee 41418* (NY, US), *Black 52-14921* (IAN, US), *Foster 110* (US, USZ).

Justicia dumetorum Morong, Ann. New York Acad. Sci. 7:193. 1893. TYPE: Paraguay, *Morong 1538* (holotype NY).

Beloperone kerrii N.E. Brown, Trans. Bot. Soc. Edinburgh 20:67. 1896. TYPE: Argentina, *Kerr 108* (holotype K).

Beloperone albomarginata Lindau, Bull. Herb. Boiss. Ser. 2, 5:373. 1905. TYPE: Paraguay, Gran Chaco near Santa Elisa, *Rojas in Hassler 2755* (holotype B, destroyed, isotypes BM, G, K, NY).

Perennial herb; stems erect to ca. 75 cm, much-branched; leaves petiolate, petioles 0.5-2 cm long, blades lanceolate to ovate, 4-12 x 1-3 cm, nearly glabrous; inflorescence of dense, subsessile, axillary cymes, becoming confluent and head-like above; bracts petiolate, petioles 1-1.5 x 0.2 cm, oblong-lanceolate, shortly acuminate, leaf-like but distinct from and often longer than leaves so plant appears to have dimorphic leaves; bracteoles linear-oblanceolate, falcate, glandular-pubescent, white-margined, 7-9 mm long; calyx subequally 5-lobed, 7-19 mm long, lobes lanceolate, white-

margined; corolla reddish-brown, 30-40 mm long, tube 20-25 mm long, very gradually widened from ca. 3 mm wide at base to ca. 5 mm at mouth, upper lip nearly as long as lower lip, narrowly oblong, notched, lower lip 13-20 mm long, lobes elliptic-obovate, central lobe larger, 11 x 5 mm, laterals shorter; stamens included, ± equalling corolla; capsule obovate, lacking a long basal stipe, 12-15 x 6 mm, puberulent.

Locally frequent in seasonally flooded cacho forest and scrub in northern Argentina, Paraguay and the area surrounding the Banodos de Izazog in Bolivia. It flowers mainly from February to June at the end of the rains.

Specimens examined: SANTA CRUZ: Ibanez, *Wood, Goyder & M. Serrano 13320* (K, LPB); *Wood 13403* (K, LPB, UCZ); Chiquitos, east of Pozo del Tigre, *Wood* (sight record): Cordillera, *Fuentes & Navarro 373* (BOLV), *2434, 2447* (USZ), *2452* (BOLV, USZ).

Justicia floribunda (C. Koch) Wassh., Darwiniana 35:151. 1998. - *Libonia floribunda* C. Koch, Wochenschr. Ver. Bef. Gardenb. Kön. Preuss. Staat. 6:266. 1863. TYPE: Species was described from material cultivated in Brussels, which was collected by Libon near Rio de Janeiro, Brazil. (lectotype: the illustration in Morren, Belg. Hort. 14:12. 1864, Peichoto et al. 1998).

Sericographis pauciflora Nees, in Mart., Fl. Bras. 9:109. 1847 - *Justicia pauciflora* (Nees) Griseb., Abh. Königl. Wiss. Göttengen 24:262. 1879 (non *Justicia pauciflora* Vahl, 1796) - *Jacobinia pauciflora* (Nees) Lindau, in Engl. & Prantl, Nat. Pflanzenfam. 4(3b):351. 1895. - *Justicia rizzinii* Wassh., Baileya 19:3. 1973. TYPE: Brazil, without locality, *Sellow s.n.* (syntype B, destroyed; F photo 8914).

Branching shrubs 0.5-1 (2) m tall, stems cylindric, puberulous; leaves petiolate, blades ovate, elliptic or obovate, very variable in size, 1.5-7 x 0.8-2.5 cm, discolored, glabrate or slightly and shortly pubescent, upper larger, obtuse and cuneate, margin entire or slightly serrate; inflorescence spicate, spikes few flowered, frequently reduced to solitary flowers on slender peduncles, these to 3 cm long in axils of upper leaves; bracts and bracteoles triangular lanceolate, 1 x 0.5 mm, glabrous to shortly ciliolate; calyx 5-lobed, 5 mm long, lobes lanceolate, to 3.5 mm long, puberulous; corolla red with upper half to third yellow, 20-30 mm long, tube to 20 mm long and 5 mm in diam. at throat, puberulous without, some trichomes glandular, glabrous within, lips oblong, ca. 5 mm long, upper lip erect and obtuse or emarginate, lower lip erect or somewhat spreading and 3-lobed, lobes 2 mm long, triangular; anther thecae slightly superposed, oblique; capsule claviform, 12-17 x 4 x 2 mm, glabrous or glandular puberulous; seeds flattened, suborbicular, ca. 2 mm in diam., brownish, somewhat rugulose.

Introduced species native to Brazil, Paraguay and Argentina and cultivated in Bolivia as a potted plant.

Specimens examined: CHUQUISACA: Oropeza, *Wood 13409* (K, LPB).

Justicia glaziovii Lindau, Bull. Herb. Boiss., ser. I, 3;:483. 1895. TYPE: Brazil, *Glaziou 14168* (holotype B, destroyed; F photo 8830).

Justicia velascana Lindau, Bull. Herb. Boiss., ser. I, 3:484. 1895. TYPE: Bolivia, Santa Cruz, Velasco, *Kuntze s.n.* (holotype B, destroyed; F photo 8878; isotype NY).

Rhytiglossa paniculata Nees, in Mart., Fl Bras. 9:129. 1847. (non *Justicia paniculata* Burm. f., 1768) - *Lophothecium paniculatum* Rizz., Arquiv. Jard. Bot. Rio de Janeiro, 8:336. 1948. TYPE: Brazil, Bahia, *Blanchet 2979* (isotype BM).

Ascending herb or subshrub 1 m high, young branchlets terete, pubescent with white trichomes, striolate; leaves petiolate, blades oblong to ovate, 3-8 x 1-4 cm, pubescent on both surfaces, apically acuminate, rounded to attenuate at base; inflorescence loosely cymose, cymes borne on terminal branchlets, these secund, few-flowered; bracts and bracteoles small, glandular-puberulous, bracts subulate, 1.5 mm long, bracteoles linear, 4 mm long; calyx 4 mm long, pilose with a glandular understory, deeply 5-lobed, lobes narrowly lanceolate, 3.5-4 x 0.5 mm; corolla lilac, violet or white with violet or purple lines (chevrons) on lower lip and throat, 11-12 mm long, pilosulous, tube 5-6 mm long, basally 2 mm, apically 4-5 mm in diam., upper lip erect, 6 x 5 mm, shortly bilobed, lower lip 5 x 4-5 mm, conspicuously veined, lobes subequal, ca. 2 x 2 mm; anther thecae oblique,

united by an unusually long connective 0.75 mm long.

A widespread plant of scattered localities in Chiquitano dry forest on the Pre-Cambrian Shield of Brazil and Bolivia.

Specimens examined: SANTA CRUZ: Velasco, *Wood et al. 16586* (K, LPB, US), *Saldias 2674* (MO, US, USZ), *Guillén & Choré 1660* (MO, US, USZ), *Wasshausen & Wood 2262* (CAS, GOET, K, LPB, NY, US); Chiquitos, *Jardim 2244* (US, USZ), *D'Orbigny 725* (P), *Wood 16466* (K, LPB, US); Ñuflo de Chavez, *Wood 12521* (US), *Mamani 779* (US, USZ).

Justicia glutinosa (Bremek.) V. A. W. Graham, Kew Bull. 43:613. 1988. - *Sarotheca glutinosa* Bremek., Proc. Konin. Nederl. Akad. Wetensch., s. C,72, no. 4:426. 1969. TYPE: Bolivia, Chuquisaca, *Brooke 5677* (holotype BM).

Justicia sarotheca V. A. W. Graham, Kew Bull. 43:614. 1988. - *Sarotheca elegans* Nees, in Mart., Fl. Brasil. 9(7): 113. 1847, (non *Justicia elegans* Beauv. 1810). TYPE: Brazil, Goias, Serrâ de S. Felis, Pohl 1989 (holotype W).

Perennial, branched ascending herb 0.8-1.5 m high, stem obtusely quadrangular, puberulous; leaves petiolate, blades dark green, oblong-lanceolate to oblong-elliptic, 4-6.5 x 1.8-2.5 cm, glabrescent to strigose on both surfaces, apically subobtuse, attenuate at base; inflorescence sticky-glandular, of terminal and axillary, opposite-flowered, pedunculate spikes, peduncles 4-6.5 cm long, densely capitate; bracts linear, 5-6 x 1.5-1.8 mm, capitate; bracteoles similar to bracts except somewhat shorter; calyx 4-lobed, lobes linear, 7 x 1.5 mm, densely capitate; corolla white with prominent mauve markings, glandular-puberulous, 13-17 mm long, tube incurved, 7.5 mm long, upper lip 5 mm long, emarginate, distinctly rugulose, lower lip 7.5 mm long, palaceous, lobes 3 mm long; anther thecae affixed obliquely; capsule 15-16 x 4 x 3 mm, glandular-puberulous; seeds acutely verrucose, 3 mm in diam.

A plant of widely scattered, isolated populations in Peru, central Bolivia, northern Argentina, Brazil and Paraguay, showing a characteristic Pleistocene Arc distribution with relict populations from an ancient, more widespread dry forest. In Bolivia on steep, disturbed scrubby slopes on sandstone hills at the northern end of the Tucuman-Bolivia forest belt from 500 to 1000 m. Flowers from July to October towards the end of the winter dry season.

Specimens examined: SANTA CRUZ: Ibáñez, *Wood 9998* (K, LPB, US), *Wood 12450* (K, LPB), *Wood 14990* (K, LPB, US); Cordillera, Lagunillas, *Cárdenas 2842* (F, US); Vallegrande, *Kessler 5339* (LPB, US); Florida, *Ritter 4078* (US); Bermejo, *Fosberg 28611* (NY, US); Ichilo, *Solomon 14148* (MO, US); *Lewis 37761* (LPB); Cerro Hosana, *J. Steinbach 3364* (LIL, US); Cerro Tres Cruces, *J. Steinbach 8155* (K); between Bermejo and La Laguna, *Wood 8656* (K, US). CHUQUISACA: Siles, *Muhlbauer s.n.* (US), *Beck 9362* (LPB, US); *Wood 14210* (K, LPB); *Kessler 5042* (LPB, US).

Justicia goudotii V. A. W. Graham, Kew Bull. 43:603. 1988. - *Chaetothylax umbrosus* Nees, in DC. Prodr. 11:313. 1847, non *Justicia umbrosa* Benth. 1841. TYPE: Argentina, *Tweedie 1262* (lectotype K, designated by Ezcurra 2002:252).

Chaetothylax boliviensis Lindau, Bull. Herb. Boiss. ser. I, 3:492. 1895. TYPE: Bolivia, Santa Cruz, Velasco, *Kuntze s.n.* (holotype B, destroyed; F photo 8897; lectotype, here chosen, US-701834, isolectotypes MO, NY).

Perennial herb with ascending stems or decumbent branches 20-100 cm high, rhizomatose at base, puberulous; leaves petiolate, blades ovate, 2-9 x 1.5-3.5 cm, puberulous, apically acuminate, basally cuneate and somewhat decurrent on petioles; inflorescence spicate, spikes terminal or in the axils of upper leaves, flowers sessile, disposed in axis of inflorescence forming a unilateral spike; bracts and bracteoles lanceolate, rigid, 4-6 mm long, ciliate; calyx 8 mm long, 4-lobed, lobes rigid, linear-subulate, dorsally pubescent, ciliate; corolla pink or pinkish-purple, (10-)15-20 mm long, tube very narrow, 10-15 mm long, upper lip erect, 4 x 1 mm, lower lip wider, 5 mm long with white striations in throat, anther thecae completely superposed; capsule obovate, 7 x 2.5 mm, glabrescent, stipe short; seeds 4, 1 mm in diam., with short trichomes and glochidiate.

Locally frequent in dry forest in and around the Chaco in Brazil, Paraguay, northern Argentina and southern Bolivia reaching 2300 meters altitude and extending into the Inter-Andean valleys to the west and quite far north in the Chiquitano dry forest. It flowers from March to July.

Specimens examined: Santa Cruz: Guarayos, *Wood 1006* (K, LPB, US); German Busch, *Ritter et al. 4221, 4673* (NHA, US); Chiquitos, *Wood & Mamani 13414* (K, US), *Wood 16467* (K, LPB, US); Cordillera, *Beck 9784* (LPB, NY, US), *Peredo 518* (LIL, NY); Florida, *Vargas 4560* (FAN, US, USZ); Vallegrande, *Nee 36568* (NY); Caballero, *Wood 9442* (K, LPB, US). Cochabamba: Campero, *Wood 8134* (K, LPB, US). Chuquisaca: Zudanez, *Wood 8215, 9769, 10847* (K, US); Calvo, *Killeen 4167* (LPB, MO, US), *Saravia 11736* (CTES, US), *Murquia 532* (LPB, US); Tomina, *Munoz 28Z* (US); Zudáñez, *Beck 6246* (LPB, US). Tarija: Arce, *Ehrich 448* (LPB, US); *Solomon 10059, 10519* (MO, US); *Wood 15925* (K, LPB); Cercado, *Bastian 378, 704* (LPB, US), *Ehrich 354* (LPB, US); O'Connor, *Wood 16389* (K, LPB); Gran Chaco, *Beck 11497, 11655* (LPB, US), *Krapovickas 18703, 18777, 19152, 19165* (US); Villamontes, *Pflanz 4134* (B, US). Without precise locality: SE Bolivia, Camiri-Villa, *Badcock 223* (K); El Chorro (Chaco), *Coro 1324* (US).

Justicia hassleri (Lindau) V. A. W. Graham, Kew Bull. 43:615. 1988. - *Beloperone hassleri* Lindau, Bull. Herb. Boiss. ser. I, 6, App. 1:30. 1898. Type: Paraguay, *Hassler 1089* (isotype K).

Justicia paraguayensis V. A. W. Graham, Kew Bull. 43:605. 1988. *Chaetochlamys marginata* Lindau, Bull. Herb. Boiss. ser. I, 3:491. 1895 (non *Justicia marginata* Lindau 1894). Type: Paraguay, Sept. 1892, *Kuntze s.n.* (holotype B, destroyed; F photo 8900).

Herb 0.2-0.4 m tall, stem subterete, glabrous except pilose in decussate lines; leaves sessile, blades narrowly ovate, 3.5-8.5 x 1.5-2.5 cm, glabrate both above and below, cystoliths conspicuous, especially on upper surface, acute to acuminate at apex, rounded and clasping at base, thinly white-margined; inflorescence spicate, spikes axillary and terminal, subequalling leaves, sessile, dense, 2-3 cm long; bracts linear, long drawn out and thread-like, 18-19 x 2.5 mm, minutely puberulous, white-margined; bracteoles equal, ca. 18 x 1.5 mm; calyx 4-lobed with a minute, poorly developed fifth lobe, lobes linear, long acuminate, 15-16 x 1-1.5 mm, white-margined; corolla rose colored, 20-24 mm long, tube 15 mm long, cylindric, not ampliate, 1.5 mm in diam., minutely pilose without, upper lip 6 mm long, 1.5 mm wide at middle, bilobed, lobes ca. 1 mm long, obtuse, lower lip 6 mm long, lobes obtuse, middle lobe 3.5 mm wide, lateral lobes 3 mm wide; anther thecae superposed, 1.5 mm long ; capsule elliptic, 6 x 5 mm, glabrous, thin-walled, stipe short; seeds 4, 1 mm in diam., papillose-pilose.

An uncommon plant of dry forest from central Paraguay to southern Bolivia and SW Brazil. It flowers from April to July.

Specimens examined: Santa Cruz: Chiquitos, *Wood 16462, 17997* (K, LPB, US).

Justicia israelvargasii Wassh. & J. R. I. Wood, Kew Bull. 58:808. 2004. Type: Bolivia, Santa Cruz, Ñuflo de Cavez, Perseverancia, 300 m, 20 Jul 1995, *J. R. I. Wood 10011* (holotype K; isotypes LPB, US-3348621).

Perennial herb; stems ascending, to 1 (-2) m long, much branched, glabrescent; leaves petiolate, petioles 5-12 mm long, crisped-pubescent, blades ovate, 2-9 x 1.5-4 cm, acute at apex, sparsely hirsute and scabridulous above, more densely hirsute beneath; inflorescence of short spikes from uppermost leaf axils, dense, leafy, head-like, sticky-glandular-pilose with capitate trichomes, spikes to 5 cm long; flowers alternate in each spike with a sterile bract opposite each flower; bracts linear to oblanceolate, glandular-pilose, 5-6 x 0.75-1 mm; bracteoles similar but linear; calyx subequally 4-lobed, lobes very narrowly linear-lanceolate, 10 x 1 mm, glandular-pilose; corolla white with prominent mauve markings especially on lower lip, 23-25 mm long, pilose without with gland-tipped trichomes, upper lip notched, lower lip spreading; anthers included, thecae densely pilose on dorsal surface; capsule oblong-ellipsoid, apiculate, without a basal stipe.

Endemic to Bolivia and restricted to the zone of La Perseverancia in the basin of the Río Negro, where it grows around the edges of lowland forest with a pronounced dry season. Flowers in the winter dry season.

Specimens examined: Santa Cruz: Ñuflo de Chavez, *Frey & Kramer 649* (UCZ, Z).

Justicia kessleri Wassh. & J. R. I. Wood, Kew Bull. 58:787. 2004. Type: Bolivia , La Paz, Tamayo, 15-20 km N of Apolo, 1350 m, 7 Aug 2000, *J. R. I. Wood & Wasshausen 16610* (holotype K; isotype LPB, US-3442808).

Perennial herb; stems at first decumbent and rooting, then erect to 40 cm, dark green, bifariously pubescent; leaves petiolate, petioles to 8 mm long, blades ovate to lanceolate, often falcate, 3.5-9 x 0.7-3.5 cm; inflorescence of dense, rounded, shortly pedunculate heads from upper leaf axils, peduncles 0-5 mm long, heads 1.5-3 cm long and wide; floral bracts linear-lanceolate or very narrowly elliptic, 13-15 x 1 mm, slightly longer than calyx; calyx subequally 5-lobed, 11-13 mm long, lobes linear, minutely ciliolate; corolla tube 14-18 mm long, 0.75 mm wide, pale brown, pilose, upper lip brown-pilose without, pink within, 3-5 mm long, spreading, entire, lower lip elliptic, deflexed, 4-5 mm long, brown-pilose without, lobes oblong, obtuse, 3.5 x 1.25 mm; anthers shorter than upper lip of corolla; capsule (immature) 6.5-7 x 1 mm, glabrous.

Endemic to Bolivia, but locally common in dry, deciduous forest to the north of Apolo. Flowers in the winter dry season from May to August.

Specimens examined: La Paz: Tamayo, *Gentry & Foster 71140* (MO, US), *Kessler 3868* (LPB, US), *Kessler et al. 11002* (LPB, US), *Wasshausen & Wood 2275* (K, LPB, US).

Justicia kuntzei Lindau ssp. **kuntzei**, Bull. Herb. Boiss., ser. I, 3:483. 1895. Type: Bolivia Santa Cruz, *Kuntze s.n.* (holotype B, destroyed; F photo 8836).

Lophothecium boliviense Bremek., Verhand. Konin. Nederl. Akad. Wetensch., Afd. Natuurk., Tweede sect. C, 72:426. 1969. Type: Bolivia, Santa Cruz, Río Parapetí, *Brooke 5586* (holotype BM).

Wiry perennial herb, woody below with ascending spreading branches, to 1 m high; leaves petiolate, blades elliptic or broadly oblong, 4-11 x 2-6 cm, softly pubescent beneath, acute to shortly acuminate, tapering to a shortly decurrent base; inflorescence of small axillary and terminal panicles composed of short, subscorpioid spikes; bracts linear-lanceolate, 2-6 mm long; calyx ca. 5 mm long, subglabrous, 5-lobed, lobes triangular, tip long attenuate; corolla glabrous, 15-20 mm long, upper lip white, entire, lower lip pink; anthers with spreading obovate thecae at the same height; capsule glabrous, ca. 14 mm long.

A characteristic species of the Bosque Serrano Chaqueno found from the Santa Cruz region south to northern Argentina along the Andean foothills from 300 to about 1600 m, often growing in disturbed bushy ground on sandstone. It flowers towards the end of the winter dry season from July to October.

Specimens examined: Santa Cruz: Ichilo, *Nee 41798* (NY, US); *Wood & Menacho 12657* (K, LPB); Florida, *Acevedo 4603* (NY, US); *Cárdenas 3474* (BOLV, US); *Wood 16670* (K, LPB); Ibáñez, *Cárdenas 4423* (BOLV, US); *Wood 12446* (K, LPB); Vallegrande, *Kessler 5268* (LPB, US); Cordillera, *Wood 14185* (K, LPB). Chuquisaca: Tomina, *Wood 12578* (K, LPB); Boeto, *Kessler 5163* (LPB, US); *Wood 12736* (K, LPB); Siles, *Kessler 4859* (LPB, US). Tarija: O'Connor, *Solomon 10980* (MO, NY, US); Arce, *Fiebrig 2237* (BM, K); *Beck 9578* (LPB, NY, US), *Solomon 11152, 11279* (MO, NY, US).

Justicia kuntzei Lindau ssp. **robusta** (Rusby) Wassh. & J. R. I. Wood, Kew Bull. 58:807. 2004. - *Justicia robusta* Rusby, Bull. New York Bot. Gard. 4:430. 1907. Type: Bolivia, La Paz, Nor Yungas, Coroico, *Bang 2404* (holotype NY; isotype US-32753).

Justicia nematocalix Lindau, Engl. Bot. Jahrb. 37:642. 1906. Type: Peru, Puno, road between Sandia and Chunchusmayo, *Weberbauer 1115* (holotype B, destroyed; F photo 8846).

Herb 60-100 cm high, branchlets short, stout, suberect, pilose; leaves petiolate, blades ovate, 7-15 x 2.5-5 cm, pubescent, upper surface strigilose, lower densely yellowish-brown pubescent, apically long attenuate-acuminate, basally attenuate; inflorescence of dense, compact, short axillary and terminal, subsessile to pedunculate panicles, these not exceeding upper pair of cauline leaves; bracts linear-attenuate, 3 mm long, strongly gray-pilose; calyx 7-10 mm long, 5-lobed, lobes long and threadlike, 5-10 mm long, green, strongly gray-pilose; corolla white to violet to purple, 25 mm long, glabrescent, tube 5 mm long and broad, contracted at summit, an intruded large fold near lobes, strongly 3-ribbed, ribs connected prominent nearly straight veins, lips nearly 15 mm long, upper lip scarcely bilobed, apically incurved, lower lip 3-lobed, nearly 10 mm broad at summit, lobes subsemicircular; stamens nearly equaling corolla; anther thecae superposed; style exceeding

stamens, apically recurved.

A plant of scattered localities in dry forest in southern Peru and La Paz Department in Bolivia growing in dry forest relics from 1100 to 1800 m. It flowers from about July to November.

Specimens examined: La Paz: Inquisivi, Canamina, *Rusby 48* (NY); *Kessler 5597* (LPB, US); *Wood & Goyder 15507* (LPB); Tamayo, *Helme 79* (LPB, US), *Kessler 3943, 3958* (LPB, US), *Wood & Wasshausen 16611, 16615* (K, LPB, US); *Wasshausen & Wood 2276* (CAS, GOET, K, LPB, NY, US); Caupolican, *Cárdenas 5695* (BOLV, K, US).

Justicia laevilinguis (Nees) Lindau, Bot. Jahrb. Syst. 19, Beibl. 48:20. 1894. *Rhytiglossa laevilinguis* Nees, in Mart., Fl. Bras. 9(7):120. 1847. Type: Brazil, *Sellow 3331, 3346* (syntype B, destroyed; F photo 8838).

Justicia obtusifolia (Nees) Lindau, Bull. Herb. Boiss. ser. II, 3:633. 1903. - *Rhytiglossa obtusifolia* Nees, in Mart., Fl. Bras. 9(7):120. 1847. Type: Brazil, *Sellow s.n.* (syntype B, destroyed; F photo 8848).

Dianthera graminifolia Rusby, Mem. New York Bot. Gard. 7:366. 1927. Type: Bolivia, Beni, Lake Rogagua, *Rusby 1421* (holotype NY).

Erect to spreading to decumbent perennial, usually aquatic, herb to 1 m tall, often rooting at lower nodes, stem sharply angled, subhexagonal to subquadrangular, ± grooved, glabrous to sparingly pubescent; leaves sessile or lowermost short-petioled, blades linear to narrowly lanceolate, 8-13 x 1-2.3 cm, glabrous to sparsely pubescent; inflorescence axillary and terminal, flowers secund, 1 per axil in slender spikes, these unilateral, pedunculate; bracts subtending flowers triangular to triangular-ovate, 0.8-2 x 0.8-1 mm; bracteoles subulate 1-2 x 0.5 mm, glabrous; calyx 5-lobed, lobes linear-lanceolate, equal, 7-8 x 0.75-1.2 mm; corolla white, tinged with violet, or dull pink, often marked with mauve markings or nectar guides on lower lip, 12-15 mm long, sparingly pubescent, tube cylindric, 5-8 mm long, upper lip erect, obovate, 4-8 x 2-4.5 mm, emarginate, lower lip spreading, obovate, 5.5-8 x 5.5-8 mm; anther thecae subequal, perpendicular to unequally inserted or superposed; capsule conspicuously large, ovate-stipitate, 14-17 x 5-6 x 0.75 mm, glabrate; seeds 4, gray or flecked brown, lacerate or dentate at tip and base. An aquatic herb with an unusually large capsule and gray or flecked-brown seed.

Widely distributed in open, seasonally swampy ground in South America, and in Bolivia found on alluvial plain in the eastern lowlands. It flowers mainly from March to June.

Specimens examined: Beni: Yacuma, *Beck 13151* (LPB, US); Ballivián, *Beck 2613* (LPB, US), *3265* (LPB, NY, US), *5305, 15063* (LPB, US), *Solomon 14779* (MO, US), Reyes, *Rusby 1339* (K, NY, US); *Wood 16262* (K, LPB); Moxos, *Schmitt 148* (MO, US); Cercado, *Townsend 37* (US). Santa Cruz: Velasco, *Guillén 1386* (MO), *3420* (US, USZ), *Seidel 3120* (LPB, US); Chiquitos, *Frey 460, 515* (MO, US); *Wood & Goyder 15737* (K, LPB); *Chavez, Wood, Goyder & Mamani 13218* (K, LPB); Busch, Puerto Suárez, *Hatschbach 30451* (MBM, US); Ibanez, W of Río Piraí, *Herzog 1405* (L); Ichilo, *Wood 10957* (K, LPB).

Justicia lineolata Ruiz & Pavón, Fl. Peruv. & Chil. 1:9. t. 13. 1798. Type: Peru, Huanuco, Cuchero, *Ruiz & Pavón B-42* (holotype MA).

Justicia flavidiflora Lindau, Bull. Herb. Boiss., ser. II, 4:409. 1904. Type: Brazil, Amazonas, Jurua Miry, *Ule 5699* (syntype HBG, F photo 8828).

Subshrub 40-75 cm high; stem erect, subterete, puberulous, older portion glabrate; leaves petiolate, blades oblong, 6-14 x 2.5-5.5 cm, glabrous, thick, coriaceous, apically rotundate-acuminate, narrowed or from narrowed to rounded at base; inflorescence a terminal panicle, often much longer than upper leaves, composed of spikes, these lax, long-pedunculate; bracts and bracteoles subulate, 1.5 x 0.75 mm; calyx 5-lobed, minutely glandular-puberulent, lobes 3 x 1 mm; corolla cream-colored, throat dark-purplish punctate, 6-10 mm long, glabrous, tube 5 mm long, upper lip 3.5-5 x 2-4 mm, obscurely bidentate, lower lip 4 x 4 mm, lobes small, middle lobe rugulose; anther thecae superposed, unequal.

Scattered in lowland rain forest along river margins in the SW Amazonian region, in Bolivia, Peru and Brazil.

Specimens examined: Pando: Manuripi, *Moraes 276* (LPB, MO, US); Roman, Abuná, *Prance 6214* (K, NY, US), W bank of Río Madeira, *Prance 6616* (K). La Paz: Iturralde, *Moraes 394* (LPB).

Justicia longiacuminata Rusby, Bull. Torrey Bot. Club 27:76. 1900. Type: Bolivia, La Paz,

Yungas, *Rusby 2411* (holotype NY).

Herbaceous, branches elongated, slender, strongly recurved and apparently reclining, terete, sparsely coarse-pilose; leaves subsessile, blades lanceolate, 2.5-4.5 x 0.7 -1 cm, sparsely coarse-pilose, apically long-acuminate, tip acute, abruptly contracted into a narrow petiole-like base, entire, thickish, bright green; inflorescence terminal spikes 20 mm long and 10-15 mm broad exclusive of flowers, dense, short-pedunculate; bracts narrowly ovate, bright green, 7-9 x 4-5 mm, pilose, margin entire, ciliolate; calyx 5 mm long, 5-lobed, lobes narrowly linear-attenuate, pilose; corollas 28-35 mm long, sparsely pilose, infundibular, slightly curved, tube 10-20 mm long, lower lip obovate, 4-10 x 5-6 mm, lobes rounded, upper lip narrowly ovate, 4-8 x 2-4 mm, minutely bilobed; anther thecae opposite to subopposite; capsule 8 x 2 x 1.5 mm, puberulous.

A very rare endemic species known only from cloud forest near Huancane in Sud Yungas. It is a threatened species within the IUCN definition.

Specimens examined: La Paz: Sud Yungas, *Beck 3046* (LPB, US), *Wood 9956* (K, LPB, US).

Justicia lutensis Wassh. & J. R. I. Wood, Kew Bull. 58:782. 2004. Type: Bolivia, Santa Cruz, Chiquito, between El Tinto and Cerro Concepción, 300 m, 27 Dec 1999, *J. R. I. Wood & Goyder 15652* (holotype K; isotypes LPB, US-3436817).

Slender perennial herb with erect or ascending stems 20-40 cm high; stems sulcate, bifariously crisped pubescent; true leaves subsessile or with short, scurfy-pubescent petiole 0-2 mm long, blade broadly to narrowly elliptic, glabrous, 1-3 x 0.5-0.8 cm; inflorescence of lax, unbranched, terminal and axillary spikes 2-10 cm long, sometimes developing into a panicle of spikes, peduncles 1-4 cm long, leaf-like bracts subtending inflorescence branches linear-oblong or linear-lancolate, 2-5 x 0.2-0.6 cm; flowers in opposite pairs, 1.5 cm apart below but closer above, one in each pair not developing properly; floral bracts triangular-ovate, subglabrous, 2-3.5 mm long; bracteoles similar but shorter; calyx 4-lobed, 3 mm long elongating to 4 mm in fruit, subglabrous, lobes equal, lanceolate; corolla white, sparsely and shortly pilose without, 9 mm long, tube ca. 6 mm long, 2.5 mm wide at mouth, upper lip ca. 3 mm long, spreading, entire, lower lip deflexed, 4-4.5 mm long, lobes elliptic, ca. 1.5 mm long and wide, lateral lobes slightly smaller; anthers included, glabrous; capsule 5.5-8 x 1.5 mm, glabrous, clavate with a narrower sterile base.

J. lutensis is an apparently rare, but possibly overlooked species of muddy hollows in seasonally dry scrub below about 300 m in the northern chaco of Bolivia and Paraguay.

Specimens examined: Santa Cruz: Cordillera, *Fuentes & Navarro 2434* (UCZ).

Justicia mandonii (Lindau) Wassh. & C. Ezcurra, Candollea 52:174. 1997. - *Beloperone mandoni* Lindau, Bull. Herb. Boiss., ser. I, 5:675. 1897. Type: Bolivia, La Paz, Larecaja, *Mandon 297* pro parte (holotype B, destroyed; isotypes BM, K, P).

Justicia odonellii de Marco & T. Ruiz, Publ. Espec. Inst. Lillo 1187:53. 1976. Type: Argentina, Tucuman: Dpto. Chicligasta, *Meyer 15125* (holotype LIL).

Perennial undershrub 2-3 m high, branches terete, younger portion minutely puberulous; leaves petiolate, blades dark-green, lanceolate to narrowly ovate, 7 x 2-2.5 cm, sparingly hirsute-pubescent, especially on midvein, apically gradually tapering to a point, subrotundate or somewhat acuminate basally; inflorescence of axillary spikes, spikes congested, alternating, short and few flowered; bracts lanceolate, 14-20 x 2-2.5 mm, pubescent; bracteoles 13-15 x 1.5-2 mm, pubescent; calyx 5-lobed, lobes 18-20 x 2-2.5 mm, pubescent; corolla dull, dark red, 40-42 mm long, minutely puberulous without, tube cylindrical, 15 mm long, upper lip erect, 23-25 x 8-10 mm, apically denticulate, lobes 2 x 2 mm, obtuse, lower lip 23 x 10 mm, palate bullate, lateral lobes 9-10 x 3.5-4 mm, middle lobe 10 x 5 mm, all obtuse; anther thecae unequal, attached unequally.

A plant of scattered localities from northern Argentina north to Sorata and only known from four localities in Bolivia between around 1800 and 2600 m. It grows in seasonally dry forest in the gullies of permanent streams. It flowers from March to June.

Specimens examined: La Paz: Larecaja, Sorata, *Brooke 6395* (BM), *Wood 8184* (K, LPB, US). Cochabamba: Ayopaya, *Wood, Hughes & Forrest 18467*

(K, LPB); Chapare, Corani, *J. Steinbach 9853* (BM, G, K, MO, UC, US). Santa Cruz: Caballero, *Wasshausen 2032* (CAS, GOET, LPB, NY, US), *Wood & Serrano 14849* (K, LPB, US).

Justicia megalantha Wassh. & J. R. I. Wood, Kew Bull. 58:801. 2004. Type: Peru, Madre de Dios, Tahuamanu, km 58, Iberia Iñapari road, 26 May 1978, *Encarnación 1155* (holotype US; isotype K).

Scrambling perennial liana to ca. 4 m; stems rounded, finely scurfy-puberulent, glabrescent; leaves petiolate, petioles 1-15 mm long, scurfy-puberulent, blade ovate or ovate-elliptic, 5-14 x 1.3-5.5 cm, glabrous, beneath with prominent veins spreading at a wide angle and with obscure darkish dots; inflorescence of pedicellate axillary flowers; flowers 1-4 in each leaf axil, pedicels 1.2-4.2 cm long, simple, scurfy-puberulent; bracts subulate, 1-3 mm long, clasping base of calyx, glabrous; bracteoles 0; calyx 2-2.5 cm long, glabrous, subequally 5-lobed, lobes narrowly lanceolate or narrowly oblong-lanceolate from a broadish base; corolla red, puberulent, 58-70 mm long, tube with a prominent bulbous base, tube 36-42 mm long, upper lip 17-25 mm long, notched with two rounded teeth, lower lip 16-23 mm long, deflexed, 3-toothed, teeth ca. 3 x 3 mm, rounded; anthers weakly exserted; capsule 20 x 8 mm, oblong-obovoid, glabrous.

Known from two widely separated localities in the SW Amazonian region of Peru and Bolivia, where it grows in riverine forest in lowland rain forest.

Specimens examined: Cochabamba: Carrasco, confluence of Río Leche and Río Isarsama, 220 m, *Beck 1619* (LPB, US).

Justicia mendax (Lindau) Wassh., Monog. Syst. Bot. Missouri Bot. Gard. 45: 1253. 1993. - *Jacobinia mendax* Lindau, Bull. Herb. Boiss., ser. II, 4: 418. 1904. Type: Peru, Puno, between Sandia & Chunchusmayo, *Weberbauer 1296* (holotype B, destroyed; F photo 8909; isotype F). Fig. 17.

Scrambling herb 0.25-1 m high, branches sometimes woody, conspicuously yellowish pubescent; leaves petiolate, blades narrowly ovate to ovate, 6.5-8 x 2.2-3.5 cm, dark green above, paler so beneath, yellowish puberulent, apically acuminate, basally rotundate; inflorescence of terminal and axillary, pedunculate, dense spikes, these equaling upper leaves, peduncles and rachises yellowish-pubescent; bracts densely imbricate, green, ovate, 10-12 x 6 mm, apically acuminate, yellowish-pilose; bracteoles equal, 5-8 x 1-1.5 mm; flowers purple with nectar guides on lower lip, pilose; calyx 5-lobed, lobes lanceolate, 4-7 x 0.5-1 mm, puberulous; corollas 24-25 mm long, tube cylindrical, 13-15 mm long, slightly enlarged in throat, upper lip erect, 10-11.5 x 3-5 mm, apically retuse, lower lip 12 x 7 mm, lateral lobes 3-4 x 2-2.5 mm, middle lobe 3 x 3 mm; anther thecae slightly superposed, ± parallel; capsule 9 x 2 mm, puberulous, stipe about half of capsule length.

A rare plant of southern Peru and two localities in northern Bolivia growing in seasonally dry forest around 1300-1600 m. It flowers at the end of the rainy season around April to July.

Specimens examined: La Paz: Tamayo, *Maldonado 2546* (LPB); Murillo, Valley of the Río Zongo, *Beck 3687, 4057, 24419* (LPB, US), *Solomon 7512* (MO), *Wasshausen 2091* (CAS, GOET, LPB, US), *Wood 12337* (K, LPB, US).

Justicia mesetarum Wassh. & J. R. I. Wood, Kew Bull. 58:792. 2004. Type: Bolivia, Santa Cruz, Velasco, Parque Noel Kempff Mercado, 2 km from Campamiento Los Fierros along road to El Encanto, 260 m, 29 Jul 2000, *Wasshausen, J. R. I. Wood & Serrano 2236* (holotype US-3443055; isotypes K, LPB).

Perennial herb; stems decumbent, ascending or weakly erect, 40-80 (-150) cm high, glabrous or very sparsely and bifariously pilose; leaves petiolate, petioles 5-10 mm long, blades lanceolate to ovate, 5-21 x 1.5-7 cm, glabrous or glabrescent above; inflorescence a terminal panicle of spikes, these very dense, sticky-glandular-pubescent, 1.5-9 cm long; flowers imbricate, rhachis and peduncles glandular-pubescent; bracts broadly oblanceolate or obovate, sticky-glandular-pubescent, imbricate, rhachis and peduncles glandular-pubescent; bracts broadly oblanceolate or obovate, sticky-glandular-pubescent, 9-10 x 3.5-7 mm; bracteoles oblanceolate, glandular-pubescent, 11-12 x 1.5-1.7 mm; calyx 12-13 mm

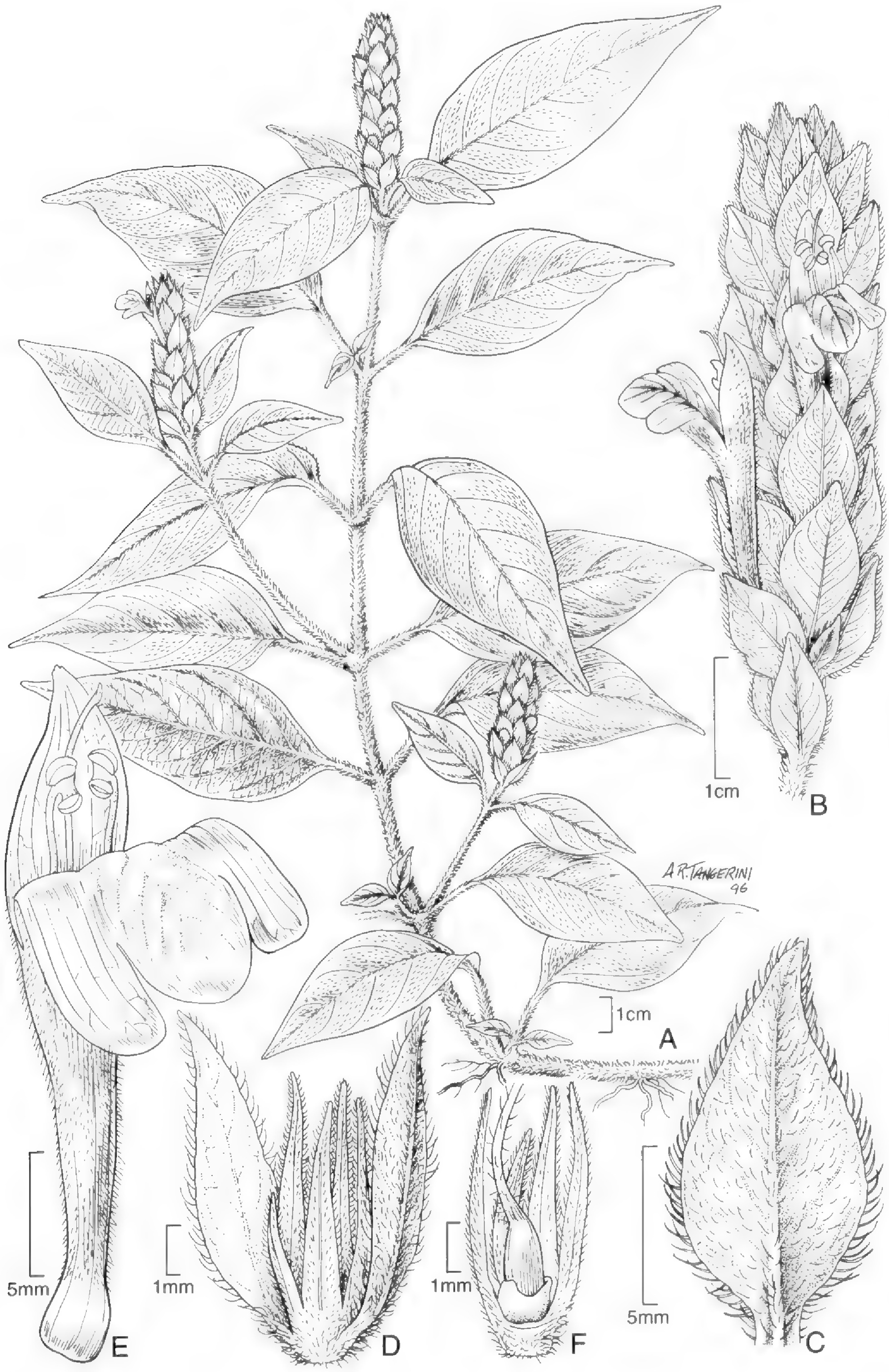


Fig. 17. *Justicia mendax*. A. Habit. B. Inflorescence. C. Bract. D. Bracts, bracteoles and calyx lobes. E. Corolla, stamens and pistil. F. Calyx lobes, pistil and cupule. (From *D. Wasshausen 2091*, US).

long, 5-lobed to base with one lobe 2-3 mm shorter than the other four, lobes linear, ca. 0.5 mm wide, glandular-pubescent; corolla deep pink, shortly puberulent without, 27-44 mm long, tube 15-22 mm long, cylindrical, lower lip deflexed, 15-20 mm long, lobes oblong, 6 x 2.5 mm, upper lip slightly shorter, 12-17 mm long, notched apically; stamens included; capsule narrowly oblanceolate, 11 x 2-3 mm, glandular pubescent.

Seasonally dry forest in the Serranias Chiquitanias (Chochis and Santiago) and the Serrania de Huanchaca on both the Brazilian and Bolivian sides, growing mainly in forest at the base of the mesetas but also occurring on the mesetas. Flowers from July to October.

Specimens examined: SANTA CRUZ: Velasco, Parque Noel Kempff Mercado, *Saldias et al. 3005* (K, MO, UCZ, US), *Vargas et al. 3979* (K, MO, UCZ), *Killeen et al. 7464* (K, MO, UCZ, US), *Ritter et al. 3594* (K, UCZ, US), *Wood & Wasshausen 16520* (K, LPB, UCZ, US), *Wasshausen & Wood 2236* (K, LPB, US); Chiquitos, *Wood 16461, 16491, 17330* (K, LPB, UCZ, US), *17485* (LPB).

Justicia miquelii V. A. W. Graham, Kew Bull. 43:605. 1988. - *Chaetochlamys lindavii* Rusby, Bull. New York Bot. Gard. 4:429. 1907, non *Justicia lindaui* C.B. Clarke 1900. TYPE: Bolivia, *Bang 2546* (holotype NY; isotypes K, US-32856).

Cinereous-puberulent herb 0.6-2 m; stems slender, green, obtusely quadrangular with swollen nodes; leaves petiolate, blades pale-green, 10-15 x 2.5-7 cm, ovate, mostly inequilateral, apically acuminate, tip acute, obtuse basally, entire, thin; inflorescence terminal, pedunculate, spicate, spikes forming a cluster with 2 flowers per node; bracts linear-oblong, 20-30 mm long, 1-nerved; bracteoles fused basally, linear-attenuate, 20 mm long; calyx 5-lobed, lobes 15 x 2.5 mm, lanceolate, apically aristate; corollas deep purple, 50-65 mm long, tube tubular, 40-50 mm long, slightly curved, upper lip slightly shorter than lower lip, apically erose, lower lip 20-25 mm long, the lobes 8-10 mm long; anther thecae superposed, oblique.

A very local endemic species of steep-sided, somewhat open forest in dry valleys in the Yungas of La Paz. Flowers from March to June.

Specimens examined: LA PAZ: Sud Yungas, San Bartolomé, *Krukoff 10240* (MO, US); Chulumani, *Beck 12635* (LPB, US); Nor Yungas, *Vargas 2137* (LPB, US); Larecaja, Mapiri, *Rusby 1111* (BM, K, NY, US), Mapiri Region, San Carlos, *Buchtien 1371* (NY, US), *1371a* (US); Murillo, *Wasshausen 2113* (CAS, CORD, K, LPB, US).

Justicia monopleurantha (Lindau) Wassh., Monogr. Syst. Bot. Missouri Bot. Gard. 45:1253. 1993. - *Beloperone monopleurantha* Lindau, Bull. Herb. Boiss., ser. II, 4:415. 1904. TYPE: Peru, Puno, between Sandia & Chunchusmayo, *Weberbauer 1202* (holotype B, destroyed; F photo 8935).

Climbing subshrub 2-4 m high; stems woody, terete, younger stems pubescent in 2 lines, the older glabrate; leaves petiolate, blades oblong, 14-23 x 3.5-7.5 cm, glabrate, apically obliquely caudate, narrowed basally; inflorescence of orange and yellowish terminal spikes, these ± equaling upper leaves, pedunculate, secundiflorus; bracts ovate, 24 x 7 mm, pubescent, apically caudate; bracteoles similar, 18 x 2 mm; flowers yellow, puberulous; calyx 5-lobed, lobes lanceolate, ca. 17 x 1.5 mm, puberulous; corolla 45-50 mm long, tube 30-35 mm long, apically 5 mm in diam., upper lip 15-25 x 7-9 mm, apically obscurely 2-dentate, lower lip 21-27 x 8 mm, lobes rotundate, lateral lobes 2 x 2 mm, middle lobe 2 x 3 mm; anther thecae superposed, unequal; capsule clavate, 15 x 4-5 x 4 mm, puberulous, stipe ca. half length of capsule, 4-seeded; seeds suborbicular, 3 mm in diam., tuberculate.

A very local species of southern Peru and northern Bolivia found in forested stream gullies in Yungas valleys, known certainly only in Bolivia from near Caranavi and the Rio Bopi valley. Flowers mainly from June to August in the dry winter season.

Specimens examined: LA PAZ: Caranavi, *Wasshausen 2121, 2138* (K, LPB, US); Nor Yungas, *Beck 9304* (LPB, US); Sud Yungas, *Krukoff 10640* (NY, US), *Beck 8503* (LPB, NY, US), Bopi River, *White 442* (NY); Tamayo, banks of Amantala, Jun 1865, *Pearce s.n.* (BM).

Justicia nodicaulis (Nees) Leonard, Contrib. Sci. Los Angeles County Mus. 32:13. 1959. *Beloperone nodicaulis* Nees, in Mart., Fl. Bras. 9:140. 1847. TYPE: Brazil, Goiás, Serra

do Macaco, *Pohl 1727* (lectotype W, here chosen).

Amphiscopia grandis Rizzini, Dusenia 3: 185. 1952. TYPE: Brazil, Goiás, Queixada, Jatai, *Macedo 1854* (isotype US).

Herb or subshrub 0.5-1.5 m high; stems knotted, trichotomous, quadrangular; leaves petiolate, blades elliptic to narrowly ovate, 20-30 x 5-6 cm, firm, entire, nitid, glabrous, apically long acuminate to cuspidate, attenuate basally; inflorescence of axillary spikes, these terminal, arranged in three ranks, confluent, short, few-flowered and subcapitate; bracts and bracteoles spreading, spathulate, 10-15 mm long, somewhat obtuse to slightly acute, equalling calyx lobes; calyx with bracteoles 12.5 mm long, lower bracts 18-25 mm long, calyx lobes oblong-lanceolate, apically acumiate, colored purplish, glabrous; corolla reddish to violet, 30-40 mm long, glabrate, tube narrowly infundibular, 15-20 mm long, upper lip 20 mm long, apically emarginate, lobes of lower lip somewhat spreading, oblong, 15-18 mm long, obtuse.

A plant of the Pre-Cambrian Shield extending from Goias in central Brazil to Bolivia, where it is only known from Parque Nacional Noel Kempff.

Specimens examined: SANTA CRUZ: Velasco, *Killeen, Panfil & Arroyo 5042* (US).

Justicia obovata Wassh. & J. R. I. Wood, Kew Bull. 58:825. 2004. TYPE: Brazil, Amazonas, Rio Purus/Rio Itaxi: Rio Curuqueta, Providencia, 27 Jul 1971, *Prance et al. 14652* (holotype K; isotypes A, F, INPA, MG, NY, R, S, U, US-2648648).

Undershrub (0.3-) 1-1.7 m high; stems rounded, ± bifariously coarsely pilose; leaves petiolate, petioles 0.3-2.5 cm long, blades narrowly oblong-elliptic, coarsely pilose with brownish trichomes, 3-17 x 2-6 cm wide; inflorescence of solitary, pedunculate spikes from upper leaf axils, peduncle 1.5-3 cm long, densely pilose, spike 3-15 cm long, flowers imbricate; bracts obovate-spathulate, densely ciliate and with a line of trichomes along dorsal midrib, 7-9 x 5-7 mm; bracteoles oblanceolate, indumentum similar to that of bracts but more glandular-pilose, 7-10 x 2 mm; calyx subequally 5-lobed, lobes 8 x 1 mm, linear, pilose with stiff, spreading eglandular trichomes; corolla yellowish, ± glabrous without, 16-17 mm long, tube ca. 9 x 2 mm with a slightly bulbous base, lips ca. 7 mm long, upper lips entire, lobes of lower lip 1 x 1 mm; anthers ± equaling lips; capsule 8-11 x 2 mm, clavate with a sterile base, ± glabrescent.

Apparently widespread but local in lowland rain forests on dry land above the rivers in the SW Amazon basin occurring in Bolivia (Pando), Peru (Madre de Dios) and Brazil (Amazonas).

Specimens examined: PANDO: Abuña, *L. Varges et al. 580* (LPB); Roman, *Solomon 17109* (MO, LPB, US); Madre de Dios, *Gonzalez 108* (US, LPB).

Justicia oranensis de Marco & T. Ruiz, Publ. Especial Inst. Lillo:46, fig. 1 & lams. 1 & 2, 1976. TYPE: Argentina, Salta, Dpto. Oran, *Legname-Cuezzo 8564* (holotype LIL).

Justicia schreiteri Lillo, Lilloa 1:59, lam. 5, 1937, *nom. nud.*

Undershrub 1-3 m high; stem glabrescent; leaves petiolate, blades ovate to elliptic, 4-15 x 1.5-8 cm, pubescent especially below, shortly tapering at both ends; inflorescence of small terminal panicles composed of short bracteate spikes; bracts imbricate, ovate-elliptic, 5-8 x 2-4 mm, rounded, densely glandular-pubescent; bracteoles oblong, ca. 6 x 2 mm, obtuse, glandular; calyx deeply 5-lobed, puberulent, 9-10 mm long, lobes linear-lanceolate, 6-7 x 1-2 mm; corolla orange-red, glandular-pubescent, 30-33 mm long, tube 17-20 mm long, enlarged to 3-4 mm at throat, lips 10 mm long, upper bidentate, lower lip spreading or weakly deflexed; anther thecae affixed at an angle, finely puberulent; capsule 13-15 mm long, stipe ca. half length of capsule, 4-seeded; seeds suborbicular, 3 mm in diam., tuberculate.

Frequent in seasonally moist forests and forest relics in the Chaco Serrano zone extending from the Santa Cruz area south to northern Argentina with almost exactly the same distribution as *Justicia kuntzei* subsp. *kuntzei* but only ascending to 1100 m. Flowers in the dry winter season from about July to October.

Specimens examined: SANTA CRUZ: Ichilo, *Nee 38834* (MO, NY, US); Florida, *Beck 7082* (LPB, US), *Wood 8638, 8651* (K, US), *Wasshausen 2050* (K, LPB, US), *Kessler 12281* (LPB, US), *Nee 50101* (NY, US); Angostura, *R. Steinbach 302* (MO, US); Vallegrande,

Kessler 5258, 5309 (LPB, US); Cordillera, *Wood 14173* (LPB, K). CHUQUISACA: Tomina, *Wood 12580* (K, LPB). TARIJA: Gran Chaco, Villamontes, *Pflanz 4104* (US), *Beck 9766* (LPB, NY, US), Yacuiba, *Beck 11585* (LPB, US).

Justicia oreadum S. Moore, Trans. Linn. Soc. II. Bot. 4:429. 1895. TYPE: Brazil, Mato Grosso, Serra da Chapada, *S. Moore 172* (holotype B, destroyed; F photo 9849).

Diffuse, decumbent shrub 1-1.5 m high; stem ascending, obscurely 4-angled, sometimes geniculate, glabrate; leaves large, membranous, petiolate, blades broadly ovate-lanceolate, 16-17 x 5-8 cm, glabrate with cystoliths prominent under a lens both above and below, apically long-acuminate, basally attenuate, margin finely repand; inflorescence a solitary, terminal spike, this simple, dense, minutely tomentose and glandular-puberulous, exceeded by the upper leaf blades, spike 5-6 cm long, peduncle 1.3-2 cm long; bracts short, linear lanceolate, 4-5 x 1 mm; bracteoles linear-lanceolate, 2-2.5 x 0.75 mm; calyx lobes 5, somewhat unequal, deeply divided, 3.5-5 x 0.8-1 mm, all puberulous and gland-dotted, posterior lobe somewhat narrowed and 3.5 mm long; corolla white marked with purplish parallel lines in tube, 11-15 mm long, tube constricted at base then abruptly and ± unilaterally expanded at 4 mm above base, 3.5-6 mm wide at throat, upper lip slightly shorter than lower lip, rounded-ovate, obtuse, entire, lower lip 10 x 10 mm broadly obovate, obtusely 3-lobed, lobes 1.5 mm long, anther thecae ± parallel to one another.

A rare species known from very few collections in Mato Grosso (Brazil) and a single, very old collection from Bolivia. This species should be considered as threatened within the IUCN definition.

Specimens examined: SANTA CRUZ: Velasco, Jul 1892, *Kuntze s.n.* (NY).

Justicia pectoralis Jacq., Enum. Syst. Pl. 11. 1760. - *Dianthera pectoralis* (Jacq.) Murr., Syst. Veg., ed. 14, 64. 1784. - *Stethoma pectoralis* (Jacq.) Raf., Fl. Tellur. 4:61. 1838 (1836). - *Rhytiglossa pectoralis* (Jacq.) Nees, in Benth. London J. Bot. 4:637. 1845. - Ecbolium pectorale (Jacq.) Kuntze, Rev. Gen. Pl. 2:487. 1891. - *Psacadocalymma pectorale* (Jacq.) Bremek., Verhand. Konin. Nederl. Akad. Wetensch., Afd. Natuurk., Tweede sect. 45:55. 1948. TYPE: America, specimens (if any exist) are not known.

Justicia stuebelii Lindau, Engl. Bot. Jahrb.21:378. 1895. TYPE: Peru, Rio Hallaga, *Stübel 70c* (holotype B, destroyed; F photo 8871).

Sweetly fragrant erect to spreading to decumbent perennial herbs 15-30 cm high; stems erect, unifariously pubescent; leaves subsessile to petiolate, blades ovate to linear, 3-12 x 0.2-2 cm, glabrous both above and below, acuminate to acuminate-attenuate at apex, base acute; inflorescence of terminal (sometimes also axillary in distalmost pair of leaves) pedunculate panicles of dichasiate spikes 6-15 cm long, axillary spikes alternate, 1 per axil, peduncles 1-3.5 cm long, inflorescence bracts often subfoliose, lance-subulate to subulate, 2-10 x 0.3-1 mm, inflorescence branches alternate or opposite, dichasia alternate or opposite, 1-flowered, 1 per axil, sessile; bracts opposite, subulate, 1.3-2.2 x 0.3-0.4 mm, glandular-puberulent without; bracteoles similar to bracts but smaller; flowers sessile to subsessile; calyx 2-3.5 mm long, glandular-puberulent without, 4 lobes subulate, equal, 1.5-3 x 0.3-0.5 mm, posterior 5th lobe 0.6-1.5 x 0.2 mm; corolla pale blue to lilac to violet, 6-7.5 mm long, pubescent without, tube ± expanded distally, 3.5-5 mm long, upper lip 2.5-3 mm long, entire, lower lip 3-4 mm long, lobes 0.8-1.5 x 1-1.5 mm; stamens exserted ca. 1-1.5 mm beyond mouth of corolla tube; anther thecae unequal, subparallel to parallel; capsule 5.5-9 mm long, pubescent, stipe 2-3.5 mm long, head subellipsoid with medial constrictions; seeds 4, lenticular, 1.2-1.8 x 1.2-1.5 mm, surface and margin covered with prominent knoblike tubercles. Very variable species with leaf blades linear, linear lanceolate to narrowly ovate and also somewhat variable in corolla size.

Widespread in tropical South America but rare in Bolivia where it grows on sandy soil in apparently undisturbed seasonally dry forest in lowland areas, sometimes growing on rocks by forested streams. Flowers in the winter dry season.

Specimens examined: BENI: Ballivián, *Beck 6862* (LPB, US), *Solomon 13879* (MO, NY, US). LA PAZ: Caranavi, Coroico, *Buchtien 5783* (US), *Beck 12976* (LPB, US); Nor Yungas, Tamayo, Apolo, *Williams 22*

(BM, K, NY, US). SANTA CRUZ: Ñuflo de Chávez, *Wood 10008, 10019* (K, US).

Justicia phyllocalyx (Lindau) Wassh. & C. Ezcurra, Candollea 52:175. 1997. *Poikilacanthus phyllocalyx* Lindau, Bot. Jahrb. Syst. 25, Beibl. 60:48. 1898. TYPE: Brazil, Goyas, between As Brancas and Cocal, *Glaziou 21876* (holotype B, destroyed; F photo 8785; isotypes BR, P).

Erect, perennial herb from a woody base 15-25 cm high; stem terete, densely hirsute; leaves subsessile or petiolate, blades elliptic, 2.5-4.5 x 1.5-2.2 cm, paler beneath, pubescent on both surfaces, especially on veins below, narrowed at both ends; inflorescence of solitary or paired, axillary flowers, these pedunculate, peduncle to 3 mm long; bracts inconspicuous, subulate, densely pilosulous; bracteoles filiform, 3-4 mm long, densely pilosulous; calyx 5-lobed, lobes leaf-like, rather broad, ovate-lanceolate, 10 x 1.5-2 mm, densely sericeous, apically aristate; corolla whitish, glabrate or the limb puberulous, 17-20 mm long, tube 8-14 mm long, abruptly expanded from base to 6-7.5 mm wide at mouth, upper lip broadly ovate, 9 x 9 mm, apically subbidentate, lower lip 3-lobed, lobes obovate to orbicular, 8-11 x 8-9 mm; anther thecae superposed, 2 mm long.

A plant of open grassy cerrado from scattered localities in southern Brazil, northeastern Paraguay and Bolivia. It flowers from January to March during the rainy season and is threatened in its only Bolivian locality by the southward expansion of the town of Concepcion.

Specimens examined: SANTA CRUZ: Ñuflo de Chávez, *Wood et al. 13101* (K, US).

Justicia pilosa (Ruiz ex Nees) Lindau, Engl. & Prantl, Nat. Pflanzenfam. 4 (3b):350. 1897. - *Adhatoda pilosa* Ruiz ex Nees, in DC. Prodr. 11:405. 1847. SYNTYPES: Peru, Junín, *Tafalla 29* (B, destroyed; F photo 8853; isosyntype MA); Juan del Río, *Matthews 1524* (K). Fig. 18.

Herbaceous, 25-50 cm; stem erect, upwards puberulent in decussate lines; leaves petiolate, blades elliptic to narrowly ovate, 3.5-8 x 1.5-3.5 cm, glabrate, acute to short acuminate, basally attenuate, dark-green above, paler beneath; inflorescence of simple, axillary and terminal, short-pedunculate spikes, these terminal, ± equaling upper pair of leaf blades; flowers borne unilaterally, enclosed in densely imbricate bracts, these drying dark-purplish, orbicular to broadly spatulate, 7 x 7 mm, puberulous, apically cuspidate-mucronulate, margin conspicuously ciliate; bracteoles linear, 6-7 x 0.25 mm; calyx 5-lobed, lobes linear-lanceolate, 4-5 x 0.5-0.75 mm, glabrous; corolla violet, 12-13 mm long, sparingly glandular-pilose, tube white, 8 mm long, 3-3.5 mm wide at mouth, upper lip erect, 4-5 mm long, apically bilobed, lobes 0.5 x 0.5 mm, lower lip pale lavender with magenta spots, 3-lobed, lobes erect to spreading, elliptic, 5-6 x 2-3 mm; anther thecae deep magenta, superposed.

A local species of low altitudes in the SW Amazonian basin of Peru and Bolivia extending south to a single locality near Mataracu in the Amboro National Park. Flowers from February to April.

Specimens examined: PANDO: Suarez, *Beck 17109* (LPB, US); Abuná, *Vargas et al. 598* (LPB, US). BENI: Ballivián, *Balderrama 372* (US). LA PAZ: Guanay, *Bang 1604* (NY, US). SANTA CRUZ: Ichilo, *Wood 16099, 12232* (K, LPB, US).

Justicia pluriformis Wassh. & J. R. I. Wood, Kew Bull. 58:786. 2004. TYPE: Bolivia, Cochabamba, 2 km below Independencia, 2400 m, 11 Mar 2000, *J. R. I. Wood 15985* (holotype K; isotypes BOL, LPB, US-3436816).

Perennial undershrub from a deep, woody taproot; stems much-branched, to 50 cm high, woody below with grey, glabrous bark, above green; leaves very shortly petiolate, blades extremely variable in size, shape and indumentum, lanceolate, ovate or narrowly oblong-elliptic, usually glabrous, occasionally pilose, 0.8-6 x 0.2-1.4 cm; inflorescence of terminal spikes 2-8 cm in length, elongating in fruit, interrupted below; flowers in 4-8 opposite pairs, flower pairs to 1.5 cm apart below, becoming confluent above; bracts lanceolate, ciliolate, pale-margined, 3-11 x 0.5-1.5 mm, decreasing in size upwards; bracteoles similar but only 3-4 mm long, subulate; calyx 4.5-5.5 mm long, 4-lobed, lobes lanceolate to

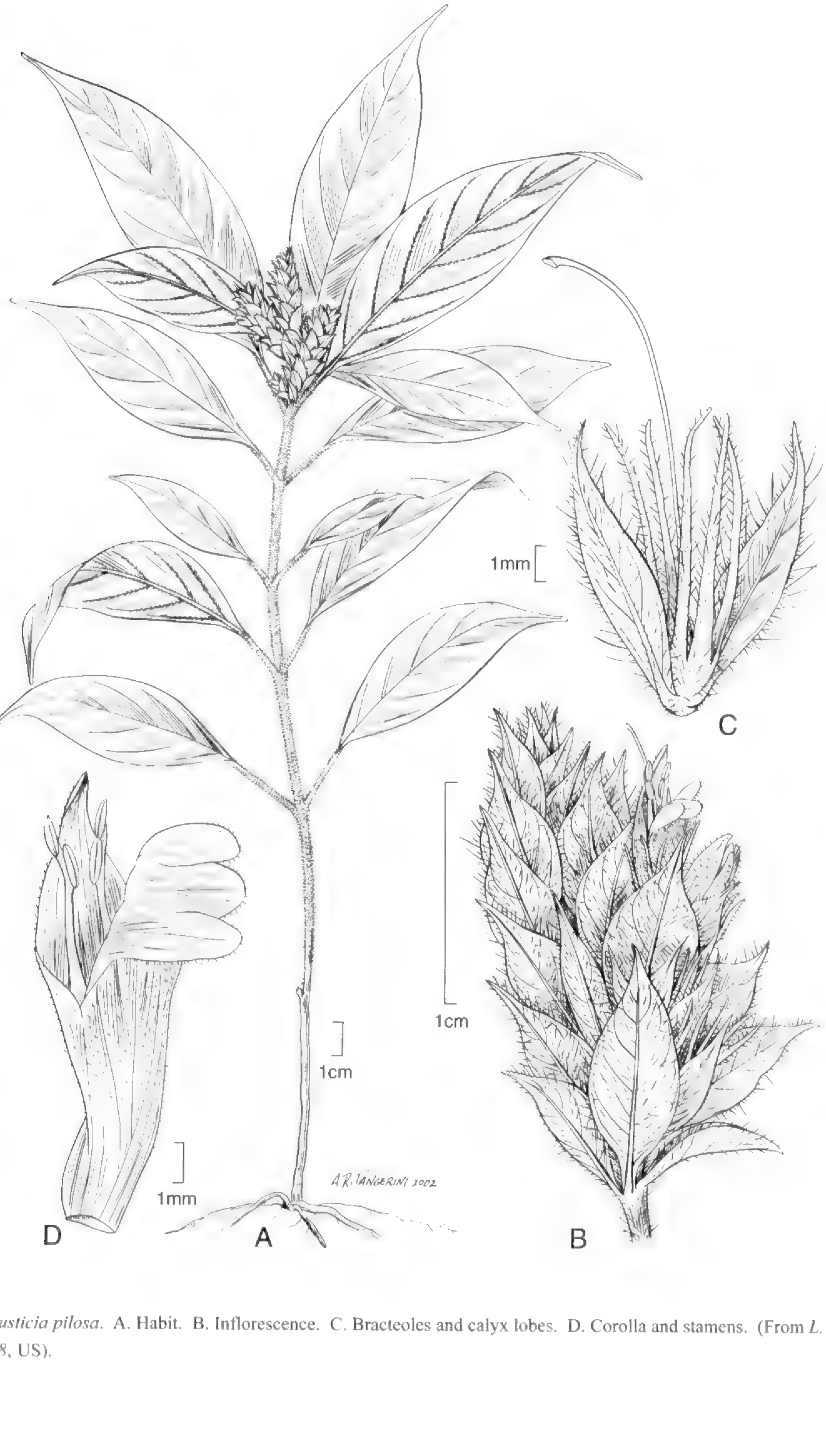


Fig. 18. *Justicia pilosa*. A. Habit. B. Inflorescence. C. Bracteoles and calyx lobes. D. Corolla and stamens. (From *L. Vargas 598*, US).

lanceolate-elliptic, white-margined, glabrous; corolla pink with cream markings in throat, puberulent without, 10-11 mm long, tube 1.5 m wide, 4.5 mm long, from a whitish base, scarcely widened at mouth, upper lip ca. 5 mm long, entire, slightly hooded, lower lip 5-6 mm long, weakly deflexed, lobes 3 x 2.5 mm, ovate; anthers very shortly exserted from corolla mouth; capsule 6-7 x 1.5 mm, obovoid, glabrous.

Endemic to dry valleys in Ayopaya province of Cochabamba Department and the neighboring Inquisivi Province of La Paz, where it grows between 2000 and 2800 m on open banks in dry bushland. Flowers in the rainy season from December to April.

Specimens examined: La Paz: Inquisivi, *Lewis 35097* (MO). Cochabamba: Without exact locality, *Kuntze s.n.* (NY); Ayopaya, *Beck 7430* (LPB, US); *Kessler et al. 9619* (LPB, US); *Wood & Zaraté 16212* (K, LPB).

Justicia praetermissa Wassh. & J. R. I. Wood, Kew Bull. 58:779. 2004. Type: Bolivia, Santa Cruz, Alto Camiri,1-2 km from main highway, ca. 3 km S of Camiri, 850 m, 19 Jan 2001, *J. R. I. Wood & Goyder 16855* (holotype K; isotypes BOL, LPB, UCZ, US-3442809).

Perennial herb to 50 cm high; stems decumbent and wiry below, then erect, sparingly branched, pilose; leaves shortly petiolate; blades ovate, green and sparingly pilose above, whitish and pilose below, 1.5-6.5 x 1.2-5.5 cm, margin indistinctly undulate; inflorescence of solitary (rarely paired) terminal spikes 3-12 (-25) cm long, peduncles pilose, to 2 cm long; flowers in opposite pairs, to 1.3 cm apart below, ± confluent above; bracts ovate, pilose, 3-4 x 1.1.25 mm; bracteoles similar but only 2-2.5 cm long; calyx 5-7 mm long, 4-lobed, lobes slightly concave and rigid, linear-lanceolate, pale-margined, pilose; corolla pink with a whitish tube, pubescent without, 10-12 mm long, tube ca. 0.8 mm wide for 5 mm then widened to 1 mm at mouth, upper lip ca. 3.5 mm, long, entire, hooded, deflexed at tip, lower lip deflexed, ca. 6 mm long, the teeth rounded; anthers included; capsule clavate with a sterile base, glabrate.

A widespread but uncommon species of dry spiny chaco scrub on light soils on the northern chaco fringes of Bolivia, Paraguay and Brazil reaching 900 m.

Specimens examined: Santa Cruz: Cordillera, *Paredo s.n.* (LIL, US), *Wood 16091* (K, LPB, UCZ, US).

Justicia ramulosa (Morong) C. Ezcurra, Bol. Soc. Argent. Bot. 25:350. 1988 (October). - *Beloperone ramulosa* Morong, Ann. New York Acad. Sc. 7:194. 1893. - *Justicia ramulosa* (Morong) V. A. W. Graham, Kew Bull. 43:604. 1988 (November). Type: Paraguay, near Ascunción, *Morong 706* (holotype NY, isotype BM; US-1320631).

Justicia tetramerioides (Lindau) V. A. W. Graham, Kew Bull. 43:604. 1988. *Beloperone tetramerioides* Lindau, Bull. Herb. Boiss.; ser. I, 3:488. 1895. Type: Bolivia, Santa Cruz, Río Yapacaní, *Kuntze s.n.* (holotype B, destroyed; F photo 8948; isotypes NY, US-701791).

Justicia magentea V. A. W. Graham, Kew Bull. 43:603. 1988. - *Beloperone velascana* Lindau, Bull. Herb. Boiss., ser. I, 3:489. 1895, non *Justicia velascana* Lindau 1895. Type: Bolivia, Santa Cruz, Velasco, *Kuntze s.n.* (holotype NY).

Justicia cochabambensis (Rusby) V. A. W. Graham, Kew Bull. 43:603. 1988. *Beloperone cochabambensis* Rusby in Mem. Torrey Bot. Club 6:103. 1896. Type: Bolivia, Cochabamba, Chapare, Espíritu Santa, *Bang 1215* (holotype NY; isotypes BM, G, K, MO, US-1178189).

Justicia pseudociliata (Mildbr.) V. A. W. Graham, Kew Bull. 43:603. 1988. *Beloperone pseudociliata* Mildbr., Notizblatt 9:1159. 1927. Type: Bolivia, Santa Cruz, Buenavista, *J. Steinbach 7137 bis* (holotype B, destroyed; F photo 8938; isotypes BM, K, MO, NY, UC).

Perennial undershrub with decumbent rooting stems and erect/ascending flowering branches 15-100 cm; leaves petiolate, blades elliptic to narrowly ovate, 4-15 x 2-8 cm, dark green above, paler so beneath, glabrate, sometimes appressed-pubescent on lower surface, apically acute, attenuate basally and somewhat decurrent on petiole; inflorescence of terminal and axillary spikes, terminal in upper pair of leaf blades; flowers sessile, dense, borne with 2 bracteoles in axils of imbricate and decussate bracts; bracts foliaceous, green, lanceolate to elliptic to narrowly

obovate, 10-15 x 3-4 mm, puberulous and ciliate, apically acute to mucronulate, with principal veins very prominent without; bracteoles linear, 6-8 mm long, ciliate, with prominent midvein; calyx deeply 4-lobed, lobes lanceolate, 6-7 mm long, ciliate; corolla vinaceous to pink, 25-40 mm long, puberulous, tube narrow, gradually expanded to 2-5 mm at mouth, lips 10-13 mm long, upper narrow, minutely bidentate, lower lip with nectar guides, lobes 4-5 x 3-4 mm; anther thecae superposed; capsule narrowly obovate, 8-10 mm long, shortly stipitate at base; seeds less than 2 mm in diam.

A very variable species of seasonally dry, lowland forests, often on sandstone and extending along valleys into the Andes to about 1200 m. Widely distributed from southern Brazil, Paraguay and northern Argentina through Bolivia to Peru, but absent from wetter areas like the Chapare. It is especially common in Chiquitano dry forest. The distribution is similar to that of *J. rusbyi* and this distribution together with local morphological variation is suggestive that present-day populations are relics of a wider, ancient Pliocene distribution. It flowers from March til September during the dry season.

Specimens examined: Beni: Ballivián, *Smith 13244* (LPB, MO, US), Ballivián & Yacuma, *Balderrama 605* (US); Marban, *Solomon 8172* (MO, NY, US). La Paz: & Beni: Río Beni, upstream from Rurrenabaque, *Daly 6532* (NY, US). La Paz: Tamayo, *Kessler 3793* (LPB, US); Saavedra, *Kessler 10394*; Larecaja, *Rusby 1113* (NY, US), *Bang 1354 B* (MO, NY, US); Sud Yungas *Krukoff 10239, 10240* (NY, US), Chulimani, *Beck 12628* (LPB, US), *Wasshausen 2199* (LPB, US), *Seidel 2014* (LPB, US); Caranavi, *Wood & Daniel 18380* (CAS, K, LPB, US); Nor Yungas *Buchtien 3909* (NY, US), *Solomon 7319* (MO, US), *Beck 3772* (LPB, US), *Beck 9314* (LPB, NY, US), *Wasshausen & Brummitt 2127* (CAS, GOET, LPB, US), *Kessler 4233* (LPB, US); Inquisivi, *Salinas 2886, 3002* (LP, US); Murillo, *Wasshausen 2115* (CAS, CORD, GOET, LPB, US); Río Mychariapo, *Williams 241* (K, NY). Santa Cruz: Velasco, *Seidel 212, 660* (LPB, US); Guarayos, *Wood 10001* (K, LPB, US); Chiquitos, *Jardim 2161* (US, USZ), *Wood 17995* (K, LPB, US); Ñuflo de Chávez, *Hopkins 155* (NY, US), *Quevedo 570* (MO), *Mamani 775* (US, USZ), *Wood 12545* (K, LPB, US); Ichilo, *J. Steinbach 5623* (G); *Nee 40891* (NY, US), *Wood 9832, 9835, 14945* (K, LPB, US), *Brummitt et al. 19325* (K, US), *I. Vargas 2489* (US, USZ), *Wasshausen 2055* (CAS, CORD, GOET, K, LPB, NY, US); Ibanez, *Wood 11058* (LPB, US); Cordillera, *Michel 643* (LPB, US), *Wood et al. 13270* (K, US); Vallegrande, *Kessler 5279, 6051, 6288* (LPB, US), *Wasshausen 2047* (CAS, CORD, GOET, K, LPB, NY, US). Chuquisaca: Tomina, *Wood 12309* (K, LPB, US); Siles, *Wood 8425, 9692* (K, LPB, US).

Justicia rhomboidea Wassh. & J. R. I. Wood, Kew Bull. 58:828. 2004. Type: Bolivia, Pando, Abuña, W bank of Río Madeira opposite Abuña, 9 Jul 1968, *Prance et al. 5730* (holotype K; isotypes INPA, NY, US).

Erect perennial herb 30-50 cm high; stems coarsely but thinly pubescent; leaves petiolate, petioles 0.7-2 cm long, pubescent, blades oblong to oblanceolate, glabrescent, 6-17 x 1.5-5 cm, acute or shortly acuminate at apex; inflorescence of shortly pedunculate spikes arising singly from upper leaf axils, peduncle 0.3-0.8 cm long, densely pilose, spikes 2-6 cm long, flowers strongly imbricate; bracts elliptic-rhomboid, shortly and densely pilose, 6-9 x 3-4.5 mm; bracteoles linear-oblanceolate, 6.5 x 1.5-3 mm; calyx subequally 5-lobed, lobes subulate, shortly glandular-pilose, 6-7 x 1 mm; corolla blue with white markings near center, ± glabrous without, 20 mm long, tube ca. 6 mm long, lips pubescent without, upper lip attenuate to a narrow, entire, hooded apex, lower lip 3 x 1.5-2.5 mm, narrowly ovate, central lobe larger than lateral; anthers glabrous, included.

Apparently a rare and local species of the SW Amazonian region (Brazil and Bolivia), where it grows near the frontier in the Río Madeira region. It is a plant of raised ground in lowland rain forest.

Justicia riedeliana (Nees) V. A. W. Graham, Kew Bull. 43:605. 1988.

Simonisia riedeliana Nees, in Mart., Fl. Bras. 9(7):145, t. 23. 1847. Type: Brazil, Rio Madeira, Riberão, *Riedel 1332* (syntype LE; isosyntype NY).

Justicia macrosiphon (Lindau) V.A.W. Graham, Kew Bull. 43:605. 1988. *Chaetochlamys macrosiphon* Lindau, Bull. Herb. Boiss., ser. I. 3:490. 1895. Type: Bolivia, Cochabamba, between Cochabamba & Chimore, *Kuntze s.n.* (holotype B, destroyed; F photo 8890; lectotype US-701835, here chosen, isolectotype NY).

Beloperone bangii Rusby, Mem. Torrey Bot. Club 6:104. 1896. Type: Bolivia, Cochabamba,

Bang 1224 (holotype NY; isotypes BM, K, MO, US-207115).

Herb or shrub 0.6-2 m high; branches purplish, subterete, the younger puberulous; leaves petiolate, blades elliptic to oblong to ovate, 14-21 x 3.5-7 cm, glabrous, apically acuminate, attenuate basally and decurrent along petiole; inflorescence of terminal and axillary compact thyrse, 3-4.5 x 3-4 cm, peduncles short, 10-15 mm long; bracts and bracteoles yellowish-green, linear-setaceous, 30-55 x 1 mm, puberulous, margin long-spreading-ciliolate; calyx 5-lobed, lobes equal, narrowly lanceolate and apically aristate-acuminate, 18-20 x 1.25-1.5 mm, puberulous, margin ciliolate; corolla red, lilac to purple with white markings at throat, 50-60 mm long, tube narrowly cylindric, 40-50 mm long, puberulous, upwards in throat oblique, 8 mm long, to 5 mm wide, upper lip erect, narrow, 8 x 3 mm, apically entire, lower lip 20 x 20 mm, 3-lobed, lobes short, 8-9 x 10 mm, obtuse; anther thecae superposed, unequal; capsule 20 x 5 x 4 mm, puberulous, stipe 8-10 mm long; seeds 4, discoid, 3 mm in diam., dark purple, glabrous.

A lowland species of moist tropical forest in the SW Amazonian basin of Peru, Brazil and Bolivia extending along the Andean foothills south to the Amboro National Park but only reaching about 600 m in altitude. It flowers in the winter dry season from April to September.

Specimens examined: PANDO: Roman, W bank of Río Madeira opp. Abuná, *Prance 5710* (K, NY, US), Río Madeira above Riberão, *Prance 6501* (NY, US); Nicolás Suárez, *Fernández 8328* (MO); Manuripi, *Jardim 2310* (US, USZ). BENI: Yacuma, Río Maniqui, *Fournet 458* (US); Ballivián, *Beck 16582* (LPB, US), *Davis 1073* (NY, US), *Daly 6459* (MO, NY, US), *Wasshausen 2163* (K, LPB, US), *Wood & Wasshausen 13787* (K, LPB, US); Serranía del Pilon Lajas, *Smith 13238* (LPB, MO, NY); Cachuela Esperanza, *Meyer 207* (NY). LA PAZ: Iturralde, *Helme 901* (LPB, US), *DeWalt 382* (US); Sud Yungas, *Seidel 2897* (LPB, US). COCHABAMBA: Carrasco, *Kessler 7887* (LPB, US); Chapare, *Wood 12384* (K, LPB, US); Espíritu Santo, *Buchtien 2306, 4714* (US), *Diers 595* (US), *Wood 8511* (K, LPB, US); Chapare/Tiraque, *Wood 13680* (K, LPB, US). SANTA CRUZ: Velasco, *Mostacedo 1646* (MO); Ñuflo de Chávez, *Wood 10005* (K, LPB, US); Ichilo, Buenavista, *J. Steinbach 5525* (MO, US), *7088* (BM, K, MO), *Nee 40880* (NY, US), *Nee & Bohs 49519, 49566* (LPB, NY, US), *I. Vargas 2507* (US, USZ), *Wasshausen 2052* (CAS, CORD, GOET. LPB, NY, US), *Wood 9833* (K, US), *10974* (US), *12231* (K, LPB, US). WITHOUT PRECISE LOCALITY: Río Beni, Jul 1886, *Rusby 1749* (NY).

Justicia rusbyana Lindau, Mem. Torrey Bot. Club 4:243. 1895. TYPE: Bolivia, La Paz, Yungas, *Bang 379* (holotype NY; isotypes BM, K, MO, US-1320209).

Understory herb or small shrub, 0.5-1.5 m high; branches terete, longitudinally sulcate, puberulent; leaves shortly petiolate, blades oblong, 7-10 x 2-3 mm, minutely tomentose both above and below, apically obtusely acuminate, narrowed basally; inflorescence of axillary spikes, these short, pedunculate, 4-12 cm long, minutely tomentose; flowers borne opposite; bracts lanceolate, 2 x 0.5 mm, densely puberulous; bracteoles lanceolate, 3-4 x 0.75-1 mm, puberulous; calyx 4-lobed, lobes lanceolate, 7 x 1.5 mm, minutely tomentose; corollas white to violet-blue, pale lilac or lavender, 15-18 mm long, both externally and internally pilose in throat, tube 9 mm long, apically 4, basally 3 mm in diam., upper lip erect, 8 x 5 mm, 2-lobed, lobes 1 mm long, lower lip 10 x 9 mm, 3-lobed, middle lobe 2 x 3 mm, lateral lobes 1.5 x 2 mm, all obtuse; anther thecae subsuperposed; capsule 14-15 mm long, drying yellowish, glabrate, stipe 5 mm long, 4-seeded; seeds ellipsoid, dark purple, 3.5 x 2 mm, minutely muricate.

An endemic species of grassy banks in deep, dry valleys of the Yungas region in La Paz Department from around 800 to 1600 m. It flowers during the rainy season mostly from January to May.

Specimens examined: LA PAZ: Saavedra, *Moraes 2339* (LPB, US), *Wasshausen 2307* (K, LPB, US); Sud Yungas, Yanacachi, *Buchtien 319* (NY, US), *Wood 13001*, (K, LPB, US), *Wood & Goyder 15472* (K, LPB, US); Nor Yungas, *Buchtien 4702* (US), *Bang 2544* (K, MO, US), *Beck 21916* (LPB, US), *Kessler 5856* (LPB, US); Caranavi, Coroico, *Buchtien 5784* (US), *Davidson 4785* (RSA, US), *Solomon 17402, 17638* (MO, US), *8550* (MO, US), *Seidel 1144* (LPB, US); Yungas, *Rusby 1171* (NY, US); Inquisivi, *Lewis 40502, 40711 882145* (LPB, MO, US); Muñecas, *Kessler 4370* (LPB, US); Loayza, *Wood & Goyder 15497* (K, LPB, US). LA ÁPAZ: *Bang 2545* (NY, US), *Buchtien 4422* (NY, US).

Justicia rusbyi (Lindau) V. A. W. Graham, Kew Bull. 43:605. 1988. *Chaetochlamys rusbyi*

Lindau, Bull. Herb. Boiss., ser. I, 3:491. 1895. SYNTYPES: Bolivia, La Paz, Larecaja, Guanay, *Rusby 1117* (syntype B, destroyed; isosyntypes BM, US-206922); Santa Cruz, without locality, *Kuntze s.n.* (syntype B, destroyed; isosyntype NY).

Justicia matthewsii (Lindau) Rusby ex Thiselton-Dyer, Index Kew., Suppl. 2:99. 1904. - *Beloperone matthewsii* Lindau, Bull. Herb.Boiss., ser. I, 6, App.1:30. 1898. TYPE: Paraguay, Cordillera, in dumento prope Cordillera de Altos, *Hassler 1936* (lectotype G, here chosen; isolectotypes K, P, NY).

Ruellia lanceolata Morong, Ann. New York Acad. Sci. 7:193. 1893, non *Justicia lanceolata* (Chapman) Small, 1933. TYPE; Paraguay, between Pirayu & Paraguari, *Morong 667* (holotype NY; isotypes MO, US-87347).

Small perennial undershrub 0.2-1.5 m high; stem trailing or ascending, eventually erect, terete to subquadrangular with swollen nodes and dark vertical lines, puberulent; leaves petiolate, blades dull, light green, especially below, ovate, 4-7.5 x 2.5-4.5, glabrate or scabrous above, puberulous to tomentose beneath, apically acute to acuminate, basally rounded to obtuse, venation prominent beneath; inflorescence terminal and axillary, short, congested, sessile spikes equaling terminal leaves, 2-4 cm long (without corollas); flowers 2-5, borne in verticils; bracts green, narrowly lanceolate, 6-17 x 2.5-5 mm, puberulent to pilose; bracteoles narrowly lanceolate 11-15 x 1-2.5 mm, puberulous to pilose, margin ciliate; calyx deeply 5-lobed, lobes narrowly lanceolate, 15-20 x 2-2.5 mm, puberulous, margins ciliolate; corolla pink with white markings on lower lip, 35-40 mm long, puberulous without, tube ca. 22 mm long, cylindrical, at ca. 12 mm above base inflexed and gradually enlarged in throat, lobes 4, subequal or slightly 2-lipped, upper lip obovate, 14-20 mm long, bilobed, lobes 2.5 mm long, lower lip 17 mm long, lobes 10 x 6 mm, obtuse; anther thecae separated, unequal; capsule 14-18 x 6.5 mm, minutely puberulent, stipe 5-8 mm long. A rather variable plant with specimens from the Chiquitania more robust, often at least 1 m high and the inflorescence with several verticels.

A plant of dry forest, forest relics and scrubby banks reaching about 1000 m. Widely distributed from southern Brazil, Paraguay through Bolivia to Peru, but absent from wetter areas like the Chapare. It is especially common in Chiquitano dry forest. The distribution is similar to that of *J. ramulosa* and this distribution together with local morphological variation is suggestive that present-day populations are relics of a wider, ancient Pliocene distribution. Flowers from February to July.

Specimens examined: LA PAZ & BENI: Río Beni, upstream from Rurrenabaque, *Daly 6543* (NY, US). LA PAZ: Tamayo, *Kessler 11020* (LPB, US); Larecaja, Guanay - Tipuani, *Bang 1354a* (BM, MO, NY, US), *1355* (BM), *Wasshausen 2117* (CAS, CORD, GOET, LPB, US); Mychariapo, *Williams 265* (BM, K, NY, US); Sud Yungas, *Wood 16280* (K, LPB, US); Caranavi, *Wood & Daniel 18381* (CAS, K, LPB, US); Nor Yungas, Alto Beni, *Seidel 2098* (LPB, US). SANTA CRUZ: Ibáñez, *Peredo s.n.* (LIL, US), *Krapovickas 36114* (CTES, MO, US), *Nee 49840* (NY, US); Florida, *Wood 8361* (K, US), *Kessler 12232* (LPB, US), *Nee 49194* (NY, US), *Ritter 3436* (NHA, US), *Ritter et al. 3426* (NHA, US); Vallegrande, *R. Steinbach 242* (MO, NY, US), *Kessler 5279* (LPB, US); Guarayos, *Wood 10004* (K, LPB, US); Ñuflo de Chávez, *Mamani 906* (MO, US), *Killeen 1003* (NY), *Jardim 1633A* (MO, US), *Wasshausen 2264* (CAS, K, LPB, NY, US), *Wood 12543* (K, LPB, US), *Wood et al. 13081*(K, LPB, US); Chiquitos, *Jardim 2168* (MO, US, USZ), *Krapovickas 36592* (CTES, MO, US); *Wood & Mamani 13455, 13492* (K, LPB, US), *Wood 17900* (K, LPB, US); Ibanez, *Wood 12458* (K, LPB, US); without precise locality, *D'Orbigny 649* (P).

Justicia saltensis de Marco & T. Ruiz, Lilloa 35(2): 13. 1980. TYPE: Argentina, Salta, Dep. Gral. San Martín, *Schreiter 3509* (holotype LIL).

Herb, suffruticose at base, erect, 0.5-1 m high; branches thin, subcylindrical, slightly 4-angled, pilose; leaves petiolate, blades ovate, 3-10 x 1.5-4.5 cm, upper surface puberulous, lower sparsely pilose, apically acute to acuminate, basally cuneate and rounded; inflorescence axillary, exceeding upper leaves, unilateral, lax spikes or in racemes of spikes, flowers sessile in axils of linear bracts and bracteoles (2), rachis glandular-pubescent; bracts and bracteoles 2-3 mm long, glandular-pubescent; calyx deeply 4-lobed, lobes narrow, subulate, 5-7 mm long, glandular-puberulous; corolla rose-colored to purple, 10-13 mm long, tube 4 mm long, throat 4 mm long and lips 6 mm long, upper 3 mm wide, slightly bidentate, lower 5 mm wide, deeply 3-lobed and reticulately veined in throat, lobes ca. 2 x 2 mm; anther thecae

obliquely separated; capsule 15 x 4 x 4 mm, stipe 5-7 mm long; seeds 4, 2.5 mm in diam., densely hirsute.

An uncommon but overlooked plant of the western Chaco of Argentina, Paraguay and Bolivia entering the Andean region along the Rio Grande Valley and ascending to about 1500 m. It grows in very dry, open scrub often in the protection of low spiny plants. It flowers mostly from January to April but flowering is very dependent on the occurrence of rain.

Specimens examined: COCHABAMBA: Campero, *Antezana 611* (BOLV, US), *López & Saravia 230* (BOLV, US), *Wood 10914* (K, LPB), *11736* (K, LPB). SANTA CRUZ: Caballero, *Wood* 11729(K, LPB); Ibanez, *Wood* 17193 (K, LPB); Chiquitos, *Wood & Mamani* 14118 (K, LPB); Cordillera, *de Michel 119* (LPB, US). CHUQUISACA: Boeto, *Wood 10663* (K, US). TARIJA: O'Connor, *Wood & Goyder 16894* (K, LPB); Gran Chaco, *Wood 16071* (K, LPB, US).

Justicia scheidweileri V. A. W. Graham, Kew Bull. 43: 617. 1988. - *Porphyrocoma lanceolata* Hook., Curtis Bot. Mag. 71:t. 4176. 1845 (non *J. lanceolata* (Chapm.) Small, 1933). - *Orthotactus pohlianus* Nees, in Mart., Fl. Bras. 9(7): 134. 1847, nom. superfl.-- type as for *P. lanceolata*; non *Cyrtanthera pohliana* Nees (see *J. carnea* Lindl.) - *Amphiscopia pohliana* Nees, in DC., Prodr. 11:359. 1847, nom. superfl. - *Porphyrocoma pohliana* Lindau, in Engl. & Prantl, Nat. Pflanzenfam. 4(3b):342. 1895, nom. superfl. TYPE: Brazil, species described from material cultivated in Brussels and Kew. The illustration, t. 4176 (above) is here chosen as the lectotype.

Herb or subshrub 30-80 cm tall; stems subquadrangular, grooved, glabrous, cystoliths prominent under a lens; leaves subsessile to petiolate, blades lanceolate, 8-15 x 2-4 cm, glabrous, dull green above with paler, silvery streaks along midvein and secondary veins, paler beneath, apically acuminate, basally attenuate and decurrent on petiole; inflorescence spicate, spikes clustered terminal and subterminally, deeply 4-angled, sessile or subsessile, 4-7 cm long and 2.5-3 cm broad; bracts imbricate, carmine red to bright purplish, obovate to orbicular, 16-18 x 12-13 mm, glabrous, acute to acuminate at tip, attenuate at bas, margin ciliolate; bracteoles spatulate-carinate, 9-10 x 3-3.25 mm, glabrous and ciliolate; calyx 5-lobed, lobes subequal, narrowly lanceolate to subulate, 5-6 x 1 mm, glabrous; corolla long exserted, tubular, purplish-blue to lilac, 30-32 mm long, glabrous, bilabiate, tube 20-22 mm long, gradually enlarged and slightly curved from base, 4-5 mm wide at throat, lips subequal, upper lip narrow, erect, 10-12 mm long, apically sparingly puberulous and bifid, lower lip broader lobed, somewhat spreading, 3-lobed, 12-13 mm long, lobes elliptic, subequal, middle lobe 4 x 2.5 mm lateral lobes 4 x 1.5 mm, all apically puberulous; anther thecae superposed; capsule oblong, stipitate, 8-9 x 3 x 2 mm, glabrous; seeds 2, flat, orbicular, 2 mm in diam.

Native to the Planalto of Brazil (Minas Gerais, Bahia); often cultivated but only rarely in Bolivia as a pot plant.

Justicia sprucei V. A. W. Graham, Kew Bull. 43:606. 1988. - *Chaetochlamys ciliata* Lindau, Bull. Herb. Boiss., ser. I, 5:677. 1897, non *Justicia ciliata* Jacq. 1772. TYPE: Brazil, Pará near Santarem, *Spruce s.n.* (holotype B, destroyed; F photo 8898; lectotype K, here chosen; isolectotype E).

Subshrub or low undershrub 50-140 cm high, branches terete, younger puberulous, older glabrate; leaves petiolate, blades oblong, 10-12 x 3.5-4 cm or somewhat smaller, glabrous except costa minutely puberulous, apically long-acuminate, tip slightly obtuse, basally oblong and gradually narrowed into petiole; inflorescence capituliform, in upper leaf axils, short-pedunculate, 2 axillary spikes and 1 short, terminal, few-flowered spike, these united, puberulous; bracts lanceolate, 12 x 2 mm, margin long, ciliate; bracteoles 15 x 1 mm, margin long-ciliate; calyx 5-lobed, lobes lanceolate, 10 x 1.5 mm, margin ciliate; corolla white or bluish-purple, 35 mm long, minutely pilosulous, tube 23-25 mm long, 3.5 mm in diam. at base, narrowed to 2.5 mm in diam. at middle, 7 mm in diam. at mouth, upper lip narrow, 10 x 6 mm, apically minutely bidentate, lower lip conspicuously 3-lobed, 11 mm long, lobes obtuse, lateral lobes 6 x 6 mm, middle 7 x 8 mm; anther thecae lying at an angle to each other; capsule clavate, 15 x 5 x 3-4 mm, ellipsoidal

head puberulous, stipe 6 mm long; seeds 4, discoid, 2.5 mm in diam., glabrous.

Amazonian species just entering Bolivia along northern riverine forests on sandy soil.

Specimens examined: PANDO: Manuripi, *Prescott 12*, *82* (MO).

Justicia squalida Wassh. & J. R. I. Wood, Kew Bull. 58:795. 2004. TYPE: Bolivia, Santa Cruz, 0.5 km W of Puerto Pailas, 200 m, 4 Mar 2001, *J. R. I. Wood 17172* (holotype K; isotypes LPB, UCZ, US-3442813).

Perennial herb; stems decumbent, rooting at nodes, then ascending to ca. 75 cm, much-branched, grey-green, crisped-pubescent; leaves petiolate, petioles 1-6 mm long, blades lanceolate to ovate, 3-8 x 1.2-5 cm, shortly pubescent, especially on margins and veins beneath; inflorescence of small, subsessile, axillary cymes, these usually few-flowered but sometimes developing into elongate clusters to 5 cm long, not becoming confluent above; bracts petiolate, petioles 1-5 mm long, blades 4-9 x 0.3-1.3 cm, oblong or oblong-lanceolate, shortly acuminate, leaf-like but distinct from and often longer than leaves so plant appears to have dimorphic leaves; bracteoles linear-oblanceolate, falcate, glandular pubescent, 11-12 x 1.5 mm; calyx subequally 5-lobed, 7-10 mm long, lobes lanceolate, white-margined; corolla pale pink or (rarely) white, glabrous or with a few short trichomes on veins or sparsely glandular pubescent, 21-32 mm long, tube 1.4-1.8 mm long, very gradually widened from ca. 3 mm wide at base to ca. 5 mm at mouth, upper lip nearly as long as lower lip, narrowly oblong, notched, lower lip 8-16 mm long, lobes elliptic-obovate, central lobe larger, 7-8 mm long, laterals 5-6 mm long; stamens included, ± equalling corolla; capsule obovate, lacking a long basal stipe, 10-12 x 5-5.5 mm, puberulent.

Restricted to disturbed, seasonally flooded scrubby areas on alluvial plain between 200 and 450 m in eastern Bolivia with a single collection from Paraguay. It is absent from true chaco, where it is replaced by *J. dumentorum*, and only just enters the edge of the Pre-Cambrian shield.

Specimens examined: PANDO: Madre de Dios, *Gonzales 117* (LPB, US). BENI: Ballivián, *Beck 2568*, *3320*, *5373*, *5817*, *5922*, *5936* (LPB, US), *Wood 16257* (K, LPB, US); Cercado, *Krapovickas & Schinini 34985* (CTES, US). SANTA CRUZ: Ñuflo de Chavez, *Mamani & Saucedi 869* (UCZ, US); Sara, *Wood 12171* (K, LPB); Warnes, *Wood 12140* (K, LPB); Chiquitos, *Wood & Mamani 13493* (K, LPB, UCZ, US); Ibanez, *Paredes s.n.* (6 Apr 1946), *s.n.* (27 Apr 1946) (LIL, US), *Wood 12253*, *13399*, *17172* (K, LPB, UCZ, US), *Nee 36258* (NY, US); Cordillera, *Beck 6457* (LPB, US).

Justicia squarrosa Griseb., Abh. Königl. Ges. Wiss. Göttingen 19:226. 1874. (Pl. Lorentz: 178. 1874). - *Beloperone squarrosa* (Griseb.) Lindau, Bot. Jahrb. Syst. 19(48):21. 1894. TYPE: Argentina, Córdoba, Ascochinga, *Lorentz 476* (holotype GOET).

Jacobinia ciliata Nees, in DC., Prodr. 11:333. 1847, non *Justicia ciliata* Jacq. 1772-3 nec Pers. 1805. TYPE: Argentina, S. Iago, *Tweedie 1261* (holotype K).

Woody herb or branching subshrub 0.15-1 m high; stems ascending or somewhat prostrate and rooting at the nodes, obtusely quadrangular, glabrous or the uppermost with one longitudinal, pilose line; leaves shortly petiolate, blade narrowly ovate to lanceolate, 3-7 x 0.5-2 cm, apically acute or acuminate, narrowed at base and somewhat decurrent on petiole, glabrate; inflorescence spicate; flowers sessile in short, dense spikes, these found in uppermost pair of leaf axils; bracts opposite, lanceolate, ca. 20 x 2 mm, apically extended with a long bristle (to 1.5 mm long) beyond margin; bracteoles linear, 20 x 1 mm, largely bristlyciliate; calyx deeply 5-lobed, lobes lanceolate, 10 x 1 mm, apically hirsute-pilose; corolla violet or pinkish-purple with white markings in throat, 25 mm long, tube slightly longer than the lips and 2-3 mm in diam., upper lip erect, narrow, 10-12 x 5 mm, bidentate, lower lip deeply 3-lobed, rugose-veined, lobes ca. 10 x 5 mm; anther thecae ± parallel to one another; capsule 10-15 x 3-4 x 3 mm, glabrous, stipe 3-8 mm long; seeds suborbicular, dark-purple, 2.5 mm in diam., nitid.

A species of the western Chaco with a similar distribution to that of *J. saltensis* but more frequent extending from central Argentina through western Paraguay and the Bolivian chaco into the Rio Grande valley system where it ascends to around 1200 m. It is a plant of dry bushland usually growing in the protection of spiny undershrubs and flowers during the rains from January to March.

Specimens examined: COCHABAMBA: Mizque, *López & Saravia 240* (BOLV, US). SANTA CRUZ: Cordillera, *Saravia 11629*, *11760* (CTES, US); Caballero, *Balcázar 368A* (MO), *Wood 11731* (K, LPB), *17788* (K, LPB, US); Vallegrande, *Wood 10647* (K, US). CHUQUISACA: Boeto, *Wood 10669* (K, US). TARIJA: Gran Chaco, *Wood & Goyder 16830* (K, LPB).

Justicia steinbachiorum Wassh. & J. R. I. Wood, Kew Bull. 58:777. 2004. TYPE: Bolivia, Cochabamba/Santa Cruz, Carrasco/Caballero, Yungas de San Mateo, "Comarapa", 2500 m, 23 Oct 1928, *J. Steinbach 8423* (holotype K; isotypes BM, E, MO).

Perennial herb 0.6-1 m high; stems green, sulcate, crisped-pubescent; leaves slightly anisophyllous, petiolate, blades lanceolate to narrowly oblong-elliptic, 3-9 x 1-3.25 cm, shortly acuminate to an obtuse apex, sparsely pubescent above, paler and pubescent beneath; inflorescence of short, terminal and axillary spikes; flowers in opposite pairs, imbricate, spikes 2-5 cm long, subsessile, hirsute; bracts ovate, 3.5-5 x 1.5 mm, pubescent, eglandular; bracteoles linear-lanceolate, ca. 3 mm long, pubescent; calyx 5-6 mm long, 4-lobed, pale green, lobes linear or narrowly lanceolate; corolla "lilac-pink", 29-32 mm long, pubescent without, tube cylindrical from a bulbous base 2 x 2 mm, narrowed to 1 mm, cylindrical for ca. 18-20 mm long, gradually widened to 4.5 mm at mouth, lips pubescent without, upper lip ca. 11 mm long, obtuse, entire, lower lip ca. 12 mm long, middle lobe broadly oblong-ovate, 3 x 3-4 mm, lateral narrower, oblong, 3 x 2.5 mm; anthers included; capsule 16-17 x 2.5 mm, clavate with a long, basal, sterile stipe.

Endemic to Bolivia where it is known from only two collections from the San Mateo area on the Andean escarpment on the border between Santa Cruz and Cochabamba Departments, thus occurring in one or both of the Amboró and Carrasco National Parks.

Specimens examined: COCHABAMBA/SANTACRUZ: Carrasco/Caballero, San Mateo, "Vallegrande", *Cardenas 4065* (US).

Justicia tenuistachys (Rusby) Wassh. & J. R. I. Wood, Kew Bull. 58:818. 2004 - *Jacobinia tenuistachys* Rusby, Mem. Torrey Bot. Club 6:105. 1896. TYPE: La Paz, between Guanay and Tipuani, *Bang 1441* (holotype NY; isotypes BM, K, MO, US-47854).

Justicia baenitzii (H. Winkl.) C. Ezcurra, Bol. Soc. Argent. Bot. 25:348. 1988. - *Beloperone baenitzii* H. Winkl., Repert Spec. Regni Veg. 7:113. 1909. TYPE: Bolivia, La Paz, Larecaja, Mapiri Region, San Carlos, *Buchtien 1409* (holotype B, destroyed; isotype US-1178198). *Beloperone viridissima* Rusby, Mem. New York Bot. Gard. 7:367. 1927. TYPE: Bolivia, La Paz, Sur Yungas, Huachi, head of Beni River, *White 550* (holotype NY; isotypes K, US-1232212).

Perennial herb with erect, glabrous stems 30-80 cm high; leaves shortly petiolate, blades elliptic, slightly unequal in size, 5-16 x 2-6 cm, glabrous, apically acuminate; inflorescence a leafless, nearly glabrous, terminal panicle formed of a few slender spikes; bracts linear, ca. 3 mm long; calyx glabrous, 4-7 mm long, 5-lobed, lobes linear-lanceolate, acute; corolla wine-red, 40-55 mm long, puberulent; anther thecae superposed and spreading horizontally; capsule clavate, 4-seeded, 12-14 x 3-4 x 3 mm, densely glandular-puberulous, stipe 3-5 mm long; seeds discoid, brownish, 2.5 x 2 mm, sparsely tuberculate, lacerate or dentate at base.

In moist forest along the foothills of the Andes between 500 and 1100 m from northern Argentina to Peru and one of the commonest *Justicia* species in moist forest from Santa Cruz northwards. Flowers in the dry season from April to September.

Specimens examined: BENI: Ballivián, *Kessler 10758*, *10818* (LPB, US); 40 km from Chapari, *Badcock 164* (K). LA PAZ: Iturralde, *Wasshausen 2166* (LPB, US), *Kessler 11184* (LPB, US); Saavedra, *Kessler 9782* LPB, US); Larecaja, Tipuani, *Buchtien 493* (US), Mapiri Region, San Carlos, *Buchtien 1360* (NY, US), *1361*, *1493*, *1494* (US), Charopampa, *Buchtien 1959* (US); Sud Yungas, *Beck 8504* (LPB, NY, US), *Seidel 2002*, *2503* (LPB, US), *Acevedo 4448* (NY, US); Nor Yungas, *Beck 9241* (LPB, US); Caranavi, *Kessler 11397* (LPB, US), *Wasshausen 2107* (CAS, CORD, GOET, LPB, US), *2141* (CAS, K, LPB, US); Murillo, *Wasshausen 2114* (CAS, GOET, LPB, US). COCHABAMBA: Chapare, *Badcock 164* (K), *Buchtien 2307* (NY, US), *Wood 10083* (K, US); Carrasco, *Sigle 503* (LPB, US), *Vargas 674* (MO). SANTA CRUZ: Ichilo, *Werdermann 2119* (MO), *Solomon 14089* (MO, NY, US), *J. Steinbach 1558* (LIL, US), *6092* (K); Florida,

Wood 9996 (K, LPB, US), *I. Vargas 5092* (NY, US, USZ), *Kessler 12226* (LPB, US); Vallegrande, *Vargas 723* (NY). TARIJA: Arce, *Beck 9554* (LPB, US), *Solomon 11085* (MO, NY, U), *11096* (MO, US), *11182* (MO), *11228* (MO, NY, US).

Justicia thunbergioides (Lindau) Leonard, Contrib. in Sci. Los Angeles County Mus. No. 32:10. 1959. - *Beloperone thunbergioides* Lindau, Bull. Herb. Boiss., ser. II, 5:372. 1905. TYPE: Brazil, Mato Grosso, *Malme 3026* (holotype B, destroyed; F photo 8949; isotype S).

Chaetochlamys tucumanensis Lillo, Lilloa 1:66, lam. 7 & 8(2). 1937. nom nud. *Justicia lilloi* (Lotti) C. Ezcurra, in Cabrera, Fl Prov. Jujuy (Rep. Argentina) 9:349. 1993. - *Chaetochlamys lilloi* Lotti, Publ. Especial Inst. Lillo : 63, fig. 1 & lam. 1, 1976. TYPE: Argentina, Salta, Capital, *Lillo 8087C* (holotype LIL).

Shrublet 0.3-1.5 m tall, stems ascending, terete, puberulous, base leggy, sometimes woody; leaves petiolate, blades ovate, 5-11 x 2.5-7 cm, both surfaces shortly and minutely tomentose or subglabrous, apically acuminate, basally rotundate and somewhat contracted-decurrent; inflorescence of 1-2 axillary and terminal flowers, these pedunculate, peduncles 5-15 mm, puberulous; bracts ovate or, more rarely, lanceolate, enclosing calyx tube, 15-30 x 12-22 mm, minutely tomentose or subglabrous, green, leaflike; bracteoles lanceolate, 10 x 1.5 mm, puberulous; calyx 5-lobed, lobes lanceolate, 10 x 2 mm, puberulous; corolla rose-violet or pink with light-colored markings on lower lip, 25-40 mm long, pilose without, tube subcylindrical, 16-20 mm long, 3-5 mm in diam., upper lip 13-15 x 3-4 mm, apically shortly bilobed, lower lip 17-20 mm long, lateral lobes 11 x 7 mm, middle lobe 12 x 8 mm; anther thecae unequally inserted or superposed; capsule 15-20 x 5-7 x 4 mm, stipe 7.5-10 mm long, glabrate; seeds 4, elliptical, 3.5 mm in diam., 2 mm thick, brown. A very variable plant with the indumentum varying from glabrous to subtomentose and the bracts from lanceolate to ovate. In the most common lowland form the flowers are enclosed in a distinct bract pair, so resembling the inflorescence of *Dicliptera*. This kind of inflorescence intergrades with one in which the flowers are clearly borne in the axils of the upper leaves. Forms of this kind are most common at higher altitudes near Sucre and Zudanez. However, both types of inflorescence are sometimes seen on the same plant.

Locally frequent in open dry woodland and on scrubby slopes extending around the western and northern chaco margins from northern Argentina through western Paraguay to southern Bolivia and Brazil, becoming less common in the eastern part of its range. It also enters the Rio Grande valley system as far as the Puente Arce region. It flowers from January to April during the rains.

Specimens examined: COCHABAMBA: Campero, *Wood 11772* (K, LPB, US), *Wood & Mendoza 19193* (K, LPB, USZ). SANTA CRUZ: Ñuflo de Chávez, *Abbot 17011* (MO, US); Chiquitos, *Mamani 1460* (MO, US), *Wood & Mamani 13425* (K, US); Florida, *Nee 48603* (NY, US), *Nee & Vargas 44683* (NY, US), *Wasshausen 2048* (CAS, CORD, GOET, LPB, NY, US), *Wood 9414, 9423* (K, US), *11141* (US); Vallegrande, *Kessler 6521* (LPB, US); *Wood 10648* (K, US), *Kessler 6521* (LPB, US); Germán Busch, Puerto Suarez, *Hatschbach 60965* (MBM, US); Cordillera, *Beck 6454* (LPB, US), *de Michel 62* (LPB, US), *Jardim 1518* (US, USZ), *Wood et al. 13239* (K, LPB, US); Caballero, Comarapa, *Herzog 1891* (L). CHUQUISACA: Oropeza, *Wood 17834* (K, LPB, US); Zudáñez, *Wood 8005, 17852* (K, LPB, US); Boeto, *Wood 10672* (K, US); Tomina, *Wood 8277* (K, US); Siles, *Beck 6392* (LPB, US), *Wood 9721, 9736* (K, US); Calvo, *Martínez 583* (LPB, US), *Saravia 11593* (CTES, US), *Wood, Goyder & Serrano 13274* (K, US). TARIJA: Gran Chaco, *Montano 156ZT* (US); O'Connor, *Wood & Goyder 15858* (K, LPB, US); Méndez, *Gerold 148* (LPB, US).

Justicia tocantina (Nees) V. A. W. Graham, Kew Bull. 43:604. 1988. *Chaetothylax tocantinus* Nees, in Mart. Fl. Bras. 9:153. 1847. TYPE: Brazil, Minas Gerais, *Clausen s.n.* (lectotype P, here chosen).

Perennial herb; stems decumbent or ascending, woody below, 20-40 cm high, occasionally reaching to 1.5 m, glabrescent or bifariously crisped-pubescent; leaves shortly petiolate, blades ovae, elliptic or oblong-elliptic, abruptly narrowed or tapering at base, then decurrent onto petiole, glabrescent, 2-15 x 1-7 cm; inflorescence of axillary and terminal spikes, becoming paniculate when fully developed, spikes 1-8 cm long, short and dense when immature,

becoming laxer, secund and subscorpioid with maturity, individual flowers somewhat distant, to 5 mm apart, indumentum variable, subglabrous to very sparsely glandular-pilose but nearly always minutely glandular-puberulent; bracts 3-3.5 x 1 mm, ovate, acuminate; bracteoles 2.5-4 mm long, lanceolate; calyx 4-lobed, 5-8 mm long, lobes linear-lanceolate, white-margined; corolla deep pink, pilose without, 27-32 mm long, tube ± cylindrical from a pale bulbous base, 18-20 mm long, widened from ca. 1 mm to 3 mm at mouth, lower lip ± spreading, 7-11 mm long, lobes obovate ca. 3 mm long, upper lip slightly shorter, 8-9 mm long, entire; stamens included; capsule oblong-oblanceolate, 7 x 1.75 mm, glabrous or minutely puberulent.

J. tocantina has its center of distribution in central Brazil with a second center restricted to an Andean area west and immediately south of Santa Cruz, Bolivia. There is an isolated population in Paraguay. The Bolivian population is different in a number of characters and is recognized as a distinct subspecies.

Justicia tocantina (Nees) V. A. W. Graham ssp. **andina** Wassh. & J. R. I. Wood, Kew Bull. 58:791. 2004. TYPE: Bolivia, Chuquisaca, Tomina, Río Limon Valley, above Puente Azera, 1400 m, 29 May 1994, *J. R. I. Wood 8450* (holotype K, isotypes LPB, US-3342176).

This is distinguished by the longer (to 7 cm), lax, subscorpioid inflorescence spike, lacking long, eglandular trichomes; the bracts are much shorter than calyx; the upper anther thecae placed only 1-1.5 mm above lower thecae.

Restricted to seasonally dry forest and bushland in the northern belt of the Tucuman-Bolivian forest zone of the Bolivian Andes in the Departments of Chuquisaca, Santa Cruz and Cochabamba, where it is locally common from 1100-1900 meters. It flowers from April to August.

Specimens examined: COCHABAMBA: Campero, *Wood 13618* (BOL, K, LPB, US). SANTA CRUZ: Caballero, *Nee & Atha 50052* (NY, US), *Wood 9442* (K. LPB, US), *10919*, *10923* (K, LPB), *10943* (K, LPB, US); Florida, *Acevedo et al. 4577* (US, USZ), *Nee et al. 49022*, *49620* (NY, US), *Ritter et al. 4077* (NHA, US), *Vargas 4560*, *4603* (US, USZ), *Wood 8363* (K, LPB, US); Valle Grande, *Kessler et al. 5264*, *5372*, *6519* (LPB, US), *J. Steinbach 3829* (LIL, US), *Wasshausen et al. 2040* (K, LPB, US); Cordillera, *Beck & Lieberman 9784* (LPB, US), *Wood et al. 13248* (K, LPB). CHUQUISACA: Boeto, *Kessler et al. 5169*; Tomina, *Kessler et al. 4819*, *5017* (LPB, US), *Munoz 282* (US), *Wood 8450*, *12302* (K, LPB, US), *12577* (K, LPB); Siles, *Kessler et al. 4882* (LPB, US), *Wood 8282* (K, LPB, US).

Justicia tweediana (Nees) Griseb., Abh. Königl. Ges. Wiss. Göttingen 19:225. 1874. (Pl. Lorentz. 177. 1874). - *Adhatoda tweediana* Nees, in DC., Prodr. 11:395. 1847. - *Justicia tweediana* (Nees) Benth., in Benth. & Hook., Gen. Pl. 2(2): 1109. 1876. *Ecbolium tweedianum* (Nees) O. Kuntze, Rev. Gen. Pl. 1(2):981. 1891. *Poikilacanthus tweedianus* (Nees) Lindau, Bot. Jahrb. Syst. 18:57. 1893. TYPE: Argentina, Córdoba, Rio Segundo, *Tweedie s.n.* (syntype K).

Justicia campestris Griseb., Abh. Königl. Ges. Wiss. Göttingen 19:225. 1874. (Pl. Lorentz. 177. 1874). excl. sinon. non *Justicia campestris* (Nees) Lindau 1895. - *Justicia lorentziana* Lindau, Bot. Jahrb. Syst. 19., Beibl. 48:20. 1894. - *Ecbolium lorentzianum* (Lindau) O. Kuntze, Rev. Gen. Pl. 3(2):248. 1898. TYPE: Argentina, Córdoba, vicinity of Las Penas, *Lorentz 118* (holotype GOET; F photo 8841; isotype K).

Justicia diamantina Lindau, Bull. Herb. Boiss., ser. II, 5:371. 1905. TYPE: Argentina, Entre Ríos, Diamante, *Malme s.n.* (lectotype S, here chosen; F photo 8822).

Suffrutescent or branching undershrub 20-50 cm high; branches erect, many with twiggy branches from base, young branches greenish and 8-sided, with striate marks between ribs, glabrous; leaves dull green, shortly petiolate, blades narrowly ovate to elliptic, 2-4 x 0.5-1.5 cm, glabrate except puberulous on midvein below, apically acute, cuneate basally; flowers sessile or shortly pedicellate, borne solitary in axils of main and lateral branchlets, forming in entirety lax and foliose spikes; bracteoles lance-subulate, 7-10 x 0.75-1 mm, puberulous; calyx deeply 5-lobed, lobes narrowly ovate to lanceolate, subequal, 4-8 mm long, foliaceous, minutely puberulous or glabrate; corolla bluish-violet, lilac to white, 18-

22 mm long, puberulent, tube short, ca. 8-10 mm long, widened into throat and approx. 8 mm in diam., lips 10-13 mm long, upper lip ovate, bilobed, lobes obtuse, 1 x 1 mm, lower lip 3-lobed, lobes divided to middle with a white throat, convex and transversely rugose-venose; anther thecae subparallel; capsule obovoid, glabrous, 13-18 x 5-6 x 4-5 mm, stipe 7-9 mm long, laterally compressed; seeds 4, suborbicular 5 x 3.5-4 mm, rugose.

Locally abundant in the subpuno vegetation of southern Bolivia and northern Argentina, where it is usually the only Acanthaceae present. North of the Rio Pilcomayo it is rare and found only near Icla and around Arani/Punata. In Bolivia it is a plant of very dry bushland between around 2700 and 3200 m. Flowers after any significant rain from December to April.

Specimens examined: COCHABAMBA: Chapare/ Arani, *Dorr 6997* (LPB, NY, US); Cerro de Punta, *Cárdenas 4066* (BOLV, US); Tiraque, *Wood 10485* (K, US); Punata, *Davidson 5056* (RSA, US). CHUQUISACA: Sud Cinti, *Hawkes et al. 4625* (MO), Sud Cinti/Nor Cinti, *Gerold 29* (LPB, US), Nor Cinti, *Wood 9492* (K, LPB, US); Zudanez, *Wood & Huaylla 18610* (K, LPB, HSB). TARIJA: Paicho, *Fiebrig 3037* (BM, K, P, US); Camaojo, *Badcock 621* (K); Méndez, *Wood 9507* (K, LPB, US), *Garcia 2302* (LPB). POTOSI: Nor Chichas, *Schulte 121, 209* (LPB, US), *Torrico 392* (LPB, US), *Wood 11911* (K, LPB, US).

Justicia umbricola Wassh. & J. R. I. Wood, Kew Bull. 58:799. 2004. TYPE: Bolivia, La Paz, Tamayo, 52 km S of Apolo towards Charazani, 1550 m, 7 Jun 1990, *Beck & Foster 18551* (holotype US; isotype LPB). Fig. 19.

Erect, pole-like undershrub ca. 1.5 m high, the leaves and inflorescence terminal on the stem; stem sparingly branched, purplish, rounded scurfy; leaves clustered at apex of stem, petiolate, petioles 0.8-2 cm long, scurfy, purplish; blades oblong or (rarely)oblong-elliptic, pilose above with scattered trichomes, scurfy on midrib and veins below, 9-18 x 2.2-5.5 cm; inflorescence of few, shortly pedunculate spikes from upper leaf axils, often appearing terminal, peduncles 1.7-2.7 cm long, scurfy-pubescent; bracts at base of spike linear, 13-18 x 0.5 mm; upper bracts narrowly lanceolate, dull purplish-yellow, 15-30 x ca. 10 mm; bracteoles similar but shorter; calyx 6-9 mm long, subequally 5-lobed, one lobe slightly narrower than others, lobes lanceolate, pubescent; corolla yellow, minutely pubescent without, 40 mm long, lips 16-18 mm long; filaments yellowish, glabrous; anthers purplish, glabrous.

Endemic to Bolivia and restricted to very moist cloud forest on either side of the Río Yuyo between Charazani and Apolo between 1300 and 1600 m. Flowers March-April.

Specimens examined: LA PAZ: Tamayo, *Wood & Wendelberger 16436* (K, LPB, US), *16658* (K, LPB); Saavedra, *Kessler et al. 9778* (LPB, US), *Wasshausen & Wood 2304* (LPB, US), *Wood & Wasshausen 16658* (K, LPB), Larecaja, Mapiri Region, San Carlos, *Buchtien 1364, 2007* (US).

Justicia vernalis Wassh. & J. R. I. Wood, Kew Bull. 58:778. 2004. TYPE: Bolivia, Chuquisaca, Tomina, ca. 2 km above Puente Azero on road to Padilla & Sucre, 1200 m, 18 Nov 1998, *J. R. I. Wood 14229* (holotype K; isotypes LPB, US-3442789).

Perennial herb; stems leggy, ± decumbent below and rooting at nodes, then ascending to 30-50 cm, green, scurfy-pubescent; leaves petiolate, blades lanceolate or oblong-lanceolate, thinly to moderately hirsute, with large-celled white trichomes on both surfaces, 3-10 x 1-4 cm; inflorescence of short, simple spikes terminal on branches, flowers in opposite pairs, to 8 mm apart below, ± confluent above, spikes very shortly pedunculate, 2-6 (-9) cm long; bracts ovate or lanceolate, covered in short, white, spreading trichomes 2.5 mm long; bracteoles linear, 2 mm long, indumentum similar to bracts; calyx 4-5 mm long, covered in short, white, spreading trichomes, 4-lobed, lobes very narrowly lanceolate; corolla 10-13 mm long, 2-lipped, tube whitish, sparse pilose, cylindrical but slightly swollen at base, 4-7 mm long, lips blue, rarely white, pubescent, upper lip 4 mm long, entire, lower lip 5-6 mm long, middle lobe ovate, ca. 2 x 2 mm; anthers included, thecae broadly oblong, glabrous; capsule clavate, pubescent, 11-15 x 2 mm.

J. vernalis is endemic to Bolivia but is locally common in the northern part of the Bolivian-Tucuman forest area between about 17°50' S and 20° S. It occurs in small, often isolated colonies in partial shade in slightly disturbed forest between 500 and 1750 m. Flowers mainly from October

Fig. 19. *Justicia umbricola*. A. Habit. B. Bract and bracteoles. C. Calyx lobes. D. Corolla and anthers. (From *O. Buchtien 1364*, US).

to December but sporadically at other times.

Specimens examined: SANTA CRUZ: Ichilo, *Kessler et al. 8544* (LPB, US), *Wood & Menacho 12665* (K, LPB, UCZ, US); Florida, *Wood 8407, 8642, 8653* (K, LPB, US), *11346* (K, LPB); Vallegrande, *Wasshausen et al. 2046* (K, LPB, US); Cordillera, *Weddell 3606* (P). CHUQUISACA: Siles, *Wood 14218* (K, LPB).

Justicia xylosteoides Griseb., Abh. Königl. Ges. Wiss. Göttingen 19:225. 1874. (Pl. Lorentz. 177. 1874.) TYPE: Argentina, Santiago del Estero, prov. Santiago, Saladillo, *Lorentz 12* (holotype GOET; isotype CORD).

Beloperone scorpioides Nees, in DC., Prodr. 11:422. 1847. - *Justicia scorpioides* (Nees) Griseb., Abh. Königl. Ges. Wiss. Göttingen 24:262. 1879. (Symb. Fl. Argent. 262. 1879) non *Justicia scorpioides* L. 1762-63. TYPE: Argentina, Tucumán, *Tweedie 1159* (holotype K).

Shrub 1-2 m high, robust; branches erect, the young branches 4-furrowed, usually glabrous; leaves subsessile or very shortly petiolate, blades narrowly elliptic, ovate or oblong, 2-6 x 0.7-1.5 cm, glabrous or very sparingly puberulent, glandular-punctate, obtuse apically, cuneate at base; inflorescence spicate, spikes sessile, dense, terminal and axillary, flowers borne opposite and decussate in pairs of lanceolate bracts with one fertile and one sterile bract in each pair, fertile larger, 10-20 x 2-4 mm, sterile smaller, rachis arched; bracteoles 2-3 mm long, scabrous-puberulous; calyx 3-4 mm long, 5-lobed, lobes ovate, acute, glabrous; corolla red, 30-45 mm long, puberulous and gland-dotted, tube 20-25 mm long, slightly enlarged in throat, lips 13-18 mm long, upper scarcely bilobed, lower deeply 3-lobed; anther thecae distinctly superposed; capsule 13 x 5 x 4 mm, stipe solid and laterally narrowed at base, upper portion inflated and 4-seeded; seeds suborbicular, flattened, 3-4 mm in diam., brown and tuberculate-rugose.

In dry bushland in NW Paraguay, NW Argentina and the very south of Bolivia. Flowers during the summer rains.

Specimens examined: TARIJA: Tojo, *Kiesling 6409* (SI). POTOSI: Tupiza, *Fiebrig 3112* (BM, K, P, US).

Justicia yungensis Wassh. & J. R. I. Wood, Kew Bull. 58:811. 2004. TYPE: Bolivia, Nor Yungas, ca. 2 km above Chala on road from Caranavi to Yolosa, 900 m, 21 Feb 1999, *Wood & Mondaca 14571* (holotype K; isotypes LPB, US-3442724).

Perennial herb; stems at first decumbent and rooting, finally erect, to 50 cm high, grey, glabrous except for scurfy pubescence, nodes distinctly swollen; leaves shortly petiolate, blades ovate, lanceolate or lanceolate-elliptic, glabrous, 7-18 x 2-6.5 cm; inflorescence a narrow, open, terminal panicle 7-20 cm long, rhachis and branches glandular-pilose; flowers in opposite pairs but on in each pair not fully developed; bracts triangular, ca. 2 mm long; bracteoles linear, ca. 1 mm long, very shortly puberulent; calyx 2-3 mm long, very shortly puberulent, subequally 5-lobed, lobes narrowly linear-lanceolate with pale margins; corolla pubescent without, 14-16 mm long, tube white, cylindrical, 10-12 x 1-1.25 mm, slightly widened at mouth, lower lip ca. 5 mm long, pale yellow with violet mouth, upper lip ca. 5 mm long, hooded, minutely notched, pale yellow with violet veins; stamens included in upper lip; capsule oblong, slightly swollen around the seeds and with a long, basal stipe, pubescent and with sessile glands, 12 x 2 mm.

Restricted to the Yungas of La Paz where it grows very locally in moist hill forest relics between 900 and 1800 m. It flowers from February to May towards the end of the rainy season.

Specimens examined: LA PAZ: Sud Yungas, *Krukoff 10095* (K, NY, US); *10131* (K, NY); Nor Yungas, *Beck 13087* (LPB, US); *Wood 16286* (K, LPB, US); Yungas, sin. loc., *Rusby 1920* (NY).

Justicia yurimaguensis Lindau, Bull. Herb. Boiss., ser. II, 4:411. 1904. TYPE: Peru, Loreto, near Yurimaguas, *Ule 6877* (holotype B, destroyed: F photo 8883; lectotype, here chosen, HBG).

Shrubby, branching, 50-120 cm high; branches pubescent; leaves petiolate, blades ovate, 2-7 x 1-3.5 cm, glabrous above, below pilose, apically acuminate, rounded, sometimes from obtuse-rounded to subacuminate, often one of the pair of leaves unequal; inflorescence spicate,

spikes terminal, erect, equaling upper pair of leaves, dense, peduncles short, rachis pubescent; bracts conspicuous, green, ovate, 6 x 3.5-4 mm pubescent, apically acuminate; bracteoles lanceolate, 5 x 1.5 mm, pubescent; calyx 4-lobed, puberulous, 4 x 0.75 mm; corolla white to yellowish, 10 mm long, throat violet, glabrous, pilose below anterior lip, tube 6 mm long, basally 2 mm wide, apically 3 mm wide, upper lip 4 x 3 mm, somewhat wrinkled within, lower lip 5 x 5 mm, lateral lobes 1 x 1 mm, middle lobe 1 x 2 mm; anther thecae parallel to one another.

An Amazonian species of Peru and Bolivia.

Specimens examined: PANDO: Manuripi, *Prescott 8* (MO).

Justicia yuyoënsis Wassh. & J. R. I. Wood, Kew Bull. 58:825. 2004. TYPE: Bolivia, La Paz, Saavedra, Cerro Asunta Pata, Apolo-Charazani (15° 3' S, 68° 29' W), 1450 m, 22 Jun 1997, *Kessler, Gonzales, Bach & Acekey 10248* (holotype US; isotype LPB).

Perennial herb 40-50 cm high; stems scurfy-puberulent above but glabrescent below; leaves long-petiolate, petioles 0.6-2.6 cm long, scurfy-puberulent; blades thin-textured, oblong, glabrous except for a scurfy-puberulent midrib below; inflorescence of short, pedunculate, axillary spikes 0.5-2 cm long; peduncle to 3 mm long, scurfy-pubescent; flowers imbicate; bracts pale green, becoming papery, spathulate, 8 x 1.5 mm, margins ciliate with long, multicellular trichomes; bracteoles oblanceolate, pale green, papery, 3 mm long, ciliate; calyx 2.5 mm long, subequally 5-lobed, lobes lanceolate, subglabrous; corolla white with reddish stripes, glabrous ca. 9 mm long, lips ca. 3 mm long, upper lip deeply notched, lower lip ovate, rounded.

A rare local endemic of very moist cloud forest on either side of the Río Yuyo around 2500 m in the Andes NE of La Paz.

Specimens examined: LA PAZ: Tamayo, *Beck & Foster 18488* (LPB, US). WITHOUT PRECISE LOCALITY: *Weddell s.n.* (P).

18. **Lepidagathis** Willd.

Lophostachys Pohl, Pl. Bras. 2:93. Fig. 161-163. 1831. LECTOTYPE: *Lophostachys villosa* Pohl.
Teliostachya Nees in Mart., Fl. Bras. 9:71. 1847. LECTOTYPE: *Teliostachya cataractae* Nees.

Erect to spreading perennial herbs or shrubs with cystoliths; leaves opposite, petiolate, sometimes conspicuously anisophyllous, margin entire to subcrenate; inflorescence of axillary and terminal densely bracteate dichasiate spikes; dichasia alternate, 1-flowered, secund, sessile to subsessile, subtended by a bract; bracts alternate, green or brightly colored, secund, both fertile and sterile bracts usually present, margin entire; flowers sessile or pedicillate, subtended by 2 bracteoles; calyx deeply 4-lobed, lobes heteromorphic, outer (anterior segment and posterior lobe)longer than inner (lateral)lobes, anterior segment comprised of 2 fused lobes apically 2-lobed, posterior lobe entire to emarginate, lateral lobes entire; corolla whitish to reddish to purple, tube ± gradually expanded distally, throat barely to clearly distinct, limb bilabiate, upper lip shallowly 2-lobed, lower lip deeply 3-lobed, corolla lobes imbricate in bud; stamens 4, didynamous, inserted near middle of corolla tube, exserted from mouth of corolla; anthers of longer pair of stamens 2-thecous, the thecae equal in size, parallel to sagittate, equally inserted, anthers of shorter pair of stamens 1-thecous, the thecae lacking basal appendages; style exserted from mouth of corolla; stigma appearing subcapitate; capsule substipitate, ellipsoid, retinacula present, septa with attached retinacula remaining attached to inner wall of mature capsule; seeds 4, homomorphic, lenticular.

A tropical genus of about 80 species, two thirds of which occur in Africa, India and Malesia. Benoist (Not. Syst. 2: 139-144. 1911) concluded that *Lophostachys* is not distinct from *Lepidagathis*. This view is shared by C. Kameyama (pers. comm.) who will publish her findings later.

Key to the species of **Lepidagathis**

1a. Spikes composed of verticellasters, these subtended by stiff, 3-nerved bracts, each consisting of 3-7 flowers ..... *L. alopecuroidea*

1b. Spikes not composed of verticellasters, densely and conspicuously bracteate, bracts secund, opposite, decussate, imbricate, reticulately veined, each consisting of 1 flower 2

2a. Fertile bracts whitish-green, 6-8 mm long; corolla white, glabrous 5-6 mm long ..... *L. alverezia*
2b. Fertile bracts red, 15 mm long; corolla rose-colored, villous-puberulous, tube 27 mm long ..... *L. sessilifolia*

Lepidagathis alopecuroidea (Vahl) R. Br. ex Griseb., Fl. Brit. W. I. 453. 1862. - *Ruellia alopecuroidea* Vahl, Eclog. Amer. 2:49. 1798. - *Teliostachya alopecuroidea* (Vahl) Nees, in Mart., Fl. Bras. 9(7): 72. 1847. TYPE: Montserrat, West Indies, *J. Ryan s.n.* (holotype C; F photo 22196). Fig. 20.

Herb 8-50 cm, usually much branched; stems erect, decumbent or ascending, sometimes rooting at lower nodes, short-pilose; leaves petiolate, blades ovate to elliptic, 3-8 x 1.5-3 cm, glabrous, thin, margin entire; inflorescence terminal, spicate, spikes composed of verticillasters, these subtended by stiff, 3-nerved bracts or lowermost by a pair of reduced cauline leaves, each consisting of 3-7 flowers, lateral flowers subtended by 1-3-nerved bracts; bracteoles 1-nerved; calyx 4-6 mm long, unequally 4-lobed; corolla white or violet, about as long as calyx, tube cylindric, throat slightly enlarged, limb 2-lipped, lower lip 3-parted, lobes subequal, upper lip obtuse, emarginate or subentire; stamens 4, didynamous; anthers 1- and 2-thecous, the thecae slightly unequal, blunt at base; capsule sessile, oblong, 3.5-4.5 mm long; seeds 4.

Widespread species of Brazil, Peru, Colombia, the Guianas, Venezuela, Trinidad-Tobago and northward to Mexico and through the West Indies, occurring rather uncommonly in Bolivia in disturbed, moist bushy ground on lowland, alluvial plains. Flowers during the dry season from April to September.

Specimens examined: BENI: Yacuma, *Beck 12762* (LPB); Ballivián, *Beck 12724* (LPB, US), *Guareco 416* (LPB, US). COCHABAMBA: Chapare, *Buchtien 2212* (US). SANTA CRUZ: Ibáñez, *Bettella 73* (LPB, US); Ichilo, *Wood 9826* (K, LPB, US); Chavez, *Wood 10017* (K, LPB).

Lepidagathis alverezia (Nees) Kameyama ex Wassh. & J. R. I. Wood, comb. nov. - *Lophostachys alverezia* Nees, in DC., Prodr. 11:246. 1847. TYPE: Peru, *Pavón s.n.* (holotype G; F photo 26581).

Lophostachys conferta Rusby, Mem. Torrey Bot. Club 6:103. 1896. TYPE: Bolivia, Mapiri, May 1886, *Rusby 1114* (holotype NY; isotypes BM, US-1320507).

Herbs or subshrubs 20-80 cm, usually much branched; stems erect, decumbent or ascending, geniculate and rooting at lower nodes, puberulous to glabrate; leaves petiolate, blades ovate to broadly elliptic, 3.5-7 x 2.5-4.5 cm, minutely puberulous, thin, margin entire; inflorescence of axillary and terminal densely bracteate dichasiate spikes; bracts anisophyllous, whitish-green, opposite and decussate, dorsal bracts in two rows, imbricate, sterile, oblique, smaller, to 5 mm long, flowering bracts longer, narrowly ovate, 6-8 mm long, margin entire, all reticulately veined; bracteoles lanceolate; calyx 4-lobed, anterior and posterior lobes outward, narrowly ovate and larger, lateral lobes inward and linear; corolla white, 8-10 mm long, scarcely exceeding calyx, tube 5-6 mm long, throat slightly enlarged, limb 2-lipped, 3 mm long, lower lip 3-lobed, lobes 1 mm long, puberulous, upper lip emarginate.

An uncommon plant of scattered localities in dry forest in Peru and Bolivia up to about 1300 m. Flowers in March to May.

Specimens examined: BENI/LA PAZ: Río Beni, upstream from Rurrenabaque, *Daly 6541* (NY, US). LA PAZ: Tamayo, *Wood & Wasshausen 1618* (LPB), Larecaja, *Buchtien 1391* (US), *Daniel & Wood 10181* (CAS, LPB); Nor Yungas, *Beck 13343* (LPB, US), *Seidel 2097* (LPB, US). San Juan, *Williams 214* (BM, K, NY, US). SANTA CRUZ: Velasco, *Beck 12398A* (LPB, US); Nuflo de Chávez, *Jardim 1636A* (MO, US); Ichilo, *Wood 16109* (K, LPB, US).

Lepidagathis sessilifolia (Pohl) Kameyama ex Wassh. & J. R. I. Wood, comb. nov., here made. - *Lophostachys sessilifolia* Pohl, Pl. bras. II:96, f. 163. 1831. TYPE: "Brazil, Goyaz", fl. *Pohl 5006* (holotype W, photo NY, SPF, photo US, isotype M).
Lophostachys pubiflora Lindau, Bull. Herb. Boiss., ser. I, 5:655. 1897. TYPE: Brazil, Mato

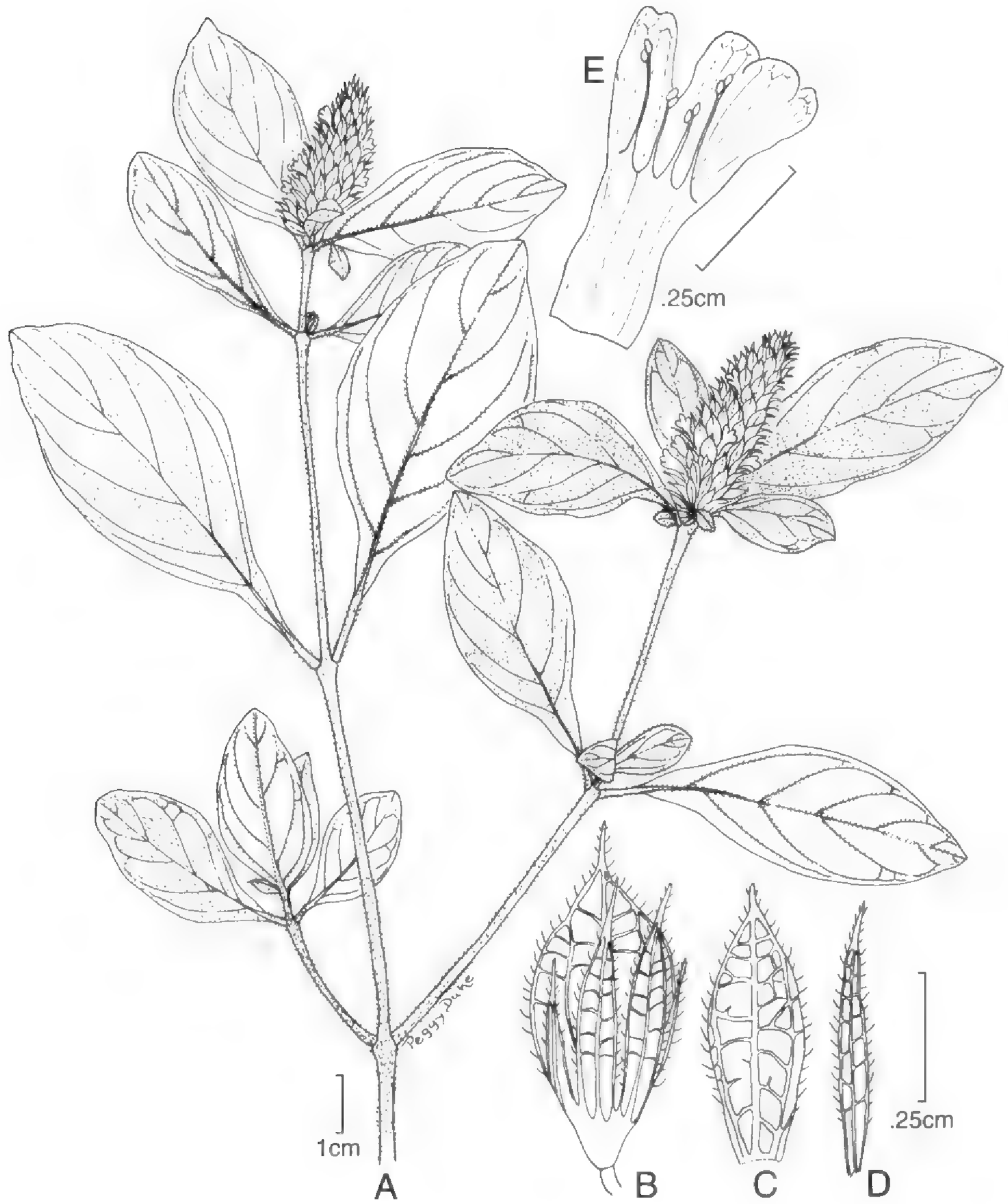


Fig. 20. *Lepidagathis alopecuroidea*. A. Habit. B. Bract, bracteoles and secondary bracteoles. C. Bracteole. D. Secondary bracteole. E. Corolla expanded. (From *W.E. Broadway 573*, US).

Grosso, Santa Cruz da Barra, *Lindman A3157* (holotype B, destroyed; F photo 8691; isotype S).

Herb or subshrub 35-60 cm; stems quadrangular, sparsely piłose to glabrate; leaves subsessile, blades broadly elliptic to obovate, 10-16 x 5-7.5 cm, glabrous; inflorescence of terminal, densely bracteate, secund, pedunculate, dichasiate spikes; bracts anisophyllous, sterile bracts green, ovate, margin ciliate, fertile bracts red, 15 x 8 mm, margin entire; bracteoles green, apically rose-colored, ovate, 16 x 5 mm, puberulous; calyx 4-lobed, posterior lobe ovate, 23 x 12 mm, puberulous, green, apically rose-colored, anterior lobe ovate, 17 x 10 mm, apically 2-dentate, lateral lobes lanceolate, hyaline, 12 x 1.5 mm, margin ciliate; corolla rose-colored, villose-puberulous, tube 27 mm long, bent inwards, throat slightly enlarged, limb glabrate, reddish-brown, 2-lipped, lower lip 3-lobed, lobes divided to base, 4 mm long, upper lip 4 x 3.5 mm, apically emarginate.

Scattered in grassy and bushy cerrado on sandy soils in eastern Bolivia and Brazil. Flowers during the rainy season from January to May.

Specimens examined: SANTA CRUZ: Velasco, *Bruderreck 221* (LPB, US), *Fisel 33* (LPB, US), *Killeen 6237* (MO, US, USZ), *Wood et al. 13137* (K, LPB, US), *18294* (K, LPB, USZ), *Guillén 1074*, *1302*, *3595* (MO, US, USZ); Sandoval, *Krapovickas 36178* (CTES, US); Guarayos, Nee *41746* (LPB, US); Ñuflo de Chavez, *R. Steinbach 847* (LPB, US), *Jardim 1967* (MO, US, USZ).

19. **Mendoncia** Vell. ex Vand.

Herbaceous or suffrutescent twining vines; stems articulated when young, glabrous or pubescent with simple or stellate, glandular and eglandular trichomes; cystoliths lacking; leaves petiolate, opposite, simple, entire; flowers solitary or clustered in leaf axils, each pedunculate and subtended by 2 large, flat or keeled, spath-like bracteoles (called bracts previously by this and other authors); bracteoles green, variously shaped and vestured, often equaling corolla tube, valvate, often partially connivent or connate, remaining closed around the flower, often widely spreading in fruit; calyx inconspicuous, annular or cupular or truncate to irregularly dentate or lobed; corolla sympetalous, hypocrateriform, not inflated above, contorted, whitish, greenish, or reddish, often with purplish markings within, tube cylindric to funnelform, limb subequally 5-lobed or bilabiate with upper lip comprised of 2 lobes and lower lip comprised of 3 lobes, lobes spreading or reflexed; stamens 4, didynamous, included, attached to corolla tube alternate with lobes; anthers bilocular with parallel, subequal to unequal thecae that are pubescent at base; staminode, if present, 1, inconspicuous; a prominent, cupular nectar-disk present around base of ovary; gynoecium of 2 carpels united to form a compound, superior, bilocular ovary, or one locule reduced or even suppressed; ovules 2 in each locule, or 2 in the one fertile locule, collateral, presumably unitegmic and tenuinucuellar, the modified funiculi of the ovules lacking; stigma shallowly and unequally bilobed; fruit drupaceous, ovoid to ellipsoid, the mesocarp fleshy, the endocarp osseous; seeds 1-2. A genus of ca. 60 species occurring from southern Mexico to southern Brazil and also in tropical Africa and Madagascar. Due to the superficial similarity of many of the species and the fact that lianas and vines are generally poorly known and collected in South America, the taxonomy of the genus is rather difficult. *Mendoncia* is sometimes placed into its own family, Mendonciaceae. However, most current specialists retain the genus in the Acanthaceae. For a somewhat detailed examination of this relationship see Brummitt (*Acanthus* 5: 1-3. 1989), *Against separating Mendonciaceae from Acanthaceae.*

Key to the species of **Mendoncia**

1a. Corolla bright red or purplish 2
1b. Corolla white, cream white or cream white and tinged yellow distally, sometimes light lilac, or white with purple splotches or lilac streaks 6

2a. Corollas 25-50 mm long 3
2b. Corollas 55-60 mm long 5

3a. Stems ferruginous-pilose ..... *M. lindavii*
3b. Stems appressed-pubescent to glabrescent 4

4a. Corolla 35-38 mm long; bracteoles sericeous; flowers 1-3 ..... *M. aspera*
4b. Corolla 25-30 mm long; bracteoles puberulous; flowers 2-5 (usually 3) ..... *M. meyeniana*

5a. Inflorescence 2-4-flowered; bracteoles oblong, 40-45 x 15 mm, tomentose ..... *M. gigas*
5b. Inflorescence 1-2-flowered; bracteoles oval, 30 x 30 mm, densely yellowish-puberulous ..... *M. robusta*

6a. Bracteoles hirsute, oblong-elliptic to ovate, 20-30 mm long; leaf blades hirsute ..... *M. bivalvis*
6b. Bracteoles glabrous, ovate, 14-20 mm long; leaf blades glabrous or nearly glabrous ..... *M. glabra*

Mendoncia aspera (Ruiz & Pav.) Nees, in DC. Prodr. 11:51. 1847. - *Mendozia aspera* Ruiz & Pav., Syst. Veg. Fl. Peruv. Chil. 158. 1798. TYPE: Peru, *Ruiz & Pavón s.n.* (holotype MA; isotypes G, P).

Herbaceous climber; stem subterete, appressed-pubescent to glabrescent; leaves petiolate, blades elliptic to broadly elliptic, 5-9 x 3-4.75 cm, firm, margin curved upwards; inflorescence axillary, flowers 1-3, clustered and pedicellate ; bracteoles green, oblong-lanceolate to ovate-lanceolate, 20-25 x 8-10 mm, sericeous, margin entire; calyx inconspicuous, annular; corolla bright red, 35-38 mm long, limb subequally 5-lobed, lobes 3-4 mm long; fruit deep purple, oblong-ovate or oblong.

Widespread in the Amazon basin from Colombia, Venezuela and the Guianas south to Peru and northern Bolivia growing in raised, non-inundated tropical evergreen forests with trees mostly less than 10 meters tall.

Specimens examined: PANDO: Román, *Prance 5766* (NY, US), *Solomon 17085* (MO); Suárez, Cobija, *Cárdenas 4170* (BOLV, US); Madre de Dios, *Nee 31388* (NY, US), *Killeen 3902A* (LPB, MO, US); Manuripi, *Fernández 8506* (MO), *Jardim 754, 2341* (MO). BENI/ LA PAZ: Río Beni, upstream from Rurrenabaque, *Daly 6440* (NY, US). BENI: Ballivián, *Beck 16451, 16501* (LPB, US), *Smith 13529, 14030* (LPB, MO, US). LA PAZ: Iturralde, *Gentry 7020 4* (MO, US); Sud Yungas, *Beck 13321* (LPB, US), *Vargas 2114* (LPB, US), *Seidel 2396* (LPB, US), *Wasshausen & Wood 2193* (CAS, K, LPB, NY, GOET, US). COCHABAMBA: Carrasco, *Beck 1618* (LPB, US), *Smith 13646* (LPB, MO, US), *Wood 14919* (K, LPB, US). SANTA CRUZ: Velasco, *Killeen 5055* (MO, US, USZ), *Quevedo 808, 878* (MO, US, USZ), *Arroyo 756* (MO, US, USZ), *Saldias 2735, 2782* (MO, US, USZ); *Daniel, Wood & Harley 10119* (LPB, CAS); Ñuflo de Chávez, *Vargas 565* (MO); Ichilo, *Nee 41056* (MO), *Wood 13575* (K, LPB).

Mendoncia bivalvis (L. f.) Merr., J. Arnold Arbor. 29:213. 1948. - *Besleria bivalvis* L. f., Suppl. 280. 1781. TYPE: Suriname, *Dahlberg s.n.* (holotype S).

Mendozia hirsuta Poepp. & Endl., Nov. Gen. Sp. Pl. 3:10. 1845. - *Mendoncia hirsuta* (Poepp. & Endl.) Nees, in DC., Prodr. 11:52. 1847. TYPE: Peru, *Poeppig 2252* (holotype W; isotype F).

Suffrutescent vine; stem quadrangular to terete, pilose; leaves petiolate, blades ovate to oblong-ovate or elliptic or sometimes sublanceolate, 6-14.5 x 3-6 cm, membranous, hirsute, margin entire; inflorescence axillary; flowers 1-2 (often 2) clustered and pedicellate; bracteoles green, oblong-elliptic to ovate, 20-30 x 8-16 mm, hirsute, thin, veiny, carinate, setiform apically; calyx inconspicuous, cupula-shaped; corolla cream white or somewhat light yellow, tinged yellow distally, 25-30 mm long, limb subequally 5-lobed, lobes suborbicular, 5 x 4 mm; fruit deep purple, oblong to ovoid.

Similar in habitat and distribution to *M. aspera*.

Specimens examined: PANDO: Madre de Dios, *Solomon 16843* (MO, US). BENI: Ballivián, Rurrenabaque, *Cárdenas 1784* (K, NY, US), *Solomon 14581* (MO, US), *Killeen 4317* (LPB, MO, US); Río Ivari, *Cárdenas 2055* (K, NY, US). LA PAZ: Sud Yungas, *Seidel 7663* (LPB, US); Larecaja, Guanay, *Rusby 2406* (NY, US); Larecaja, *Wasshausen & Wood 2202* (CAS, GOET, K, LPB, US); Caranavi, Coroico, Mar 1866, *Pearce s.n.* (BM); Iturralde, Tumapasa, *Williams 552* (BM, K, NY, US); N of La Paz, Jan 1866, *Pearce s.n.* (K). COCHABAMBA: Chapare, *R. Steinbach 526* (MO, US). SANTA CRUZ: Velasco, *Guillén 3672* (US, USZ).

Mendoncia gigas Lindau, Notizbl. Bot. Gard. Berlin 6:192. 1914. TYPE: Peru, Madre de

Dios, Río Acre, Seringal Auristella, *Ule 9800* (holotype B, destroyed; F photo 5870).

Scandent; stem terete, appressed-pubescent; leaves petiolate, blades oval to broadly elliptic, 9-13 x 5-7 cm, firm, scabrid above, yellowish pubescent below, margin entire; inflorescence axillary, 2-4-flowered; flowers pedicellate; pedicels tomentose; bracteoles oblong, 40-45 x 15 mm, tomentose, margin adglutinate; calyx truncate, minutely lobed; corolla purple or red, glabrous, tube 55 mm long, limb 5-lobed, 6-7 mm in diam.

A rare plant of the SW Amazon region of Bolivia and Peru.

Specimens examined: La Paz: Iturralde, *Gentry 70373* (MO, US).

Mendoncia glabra (Poepp. & Endl.) Nees, in DC., Prodr. 11:52. 1847. - *Mendozia glabra* Poepp. & Endl., Nov. Gen. Sp. Pl. 3:10. 1840. Type: Peru, *Ruiz & Pavón s.n.* (holotype MA; isotype OXF).

Large branched vine to 15 m; stem subquadrangular, glabrous; leaves petiolate, blades elliptic-ovate, 6-10 x 2.5-5.5 cm, membranous, glabrate, margin entire; inflorescence axillary; flowers 1-2 clustered and pedicellate; bracteoles green, ovate, 14-20 x 8-14 mm, glabrous, margin entire; calyx inconspicuous, annular; corolla creamy-white or white with purple splotches, or with dark purple veins in throat, narrow, tubular, 20-25 mm long, limb subequally 5-lobed, lobes suborbicular, 5 mm in diam.; anthers white, densely pilose basally; fruit dark purple, ellipsoid to ovoid.

Sandy flood plain and disturbed evergreen forest and secondary growth on low hills or brushy open areas at elevations between 350-450 meters. Found in Guyana, French Guiana, Ecuador, Peru, Bolivia and Amazonian Brazil.

Specimens examined: Beni: Iténez, *Moraes 1760* (LPB, US); Ballivián, *Beck 18641* (LPB, US), *Daly 6495* (NY, US); Moxos, *Krapovickas 34924* (CTES, MO, US). La Paz: Carenavi, Coroico, *Buchtien 3904* (US), *Gentry 44269* (MO); Larecaja, Mapiri, *Rusby 24O9* (NY, US). Santa Cruz: Ibáñez, *Nee 44485* (MO, NY, US); Ichilo, *J. Steinbach 7432, 7528, 7994* (BM, K, MO), *Nee 35495* (NY, US), *41062* (MO, NY, US); Velasco, *Saldias 2763* (MO, US, USZ); Ñuflo de Chávez, *Vargas 565* (MO).

Mendoncia lindavii Rusby, Mem. Torrey Bot. Club 4:241. 1895. Type: Bolivia, Cochabamba, Yungas, *Bang 532* (holotype NY; isotypes BM, US-58339). Fig. 21.

Suffrutescent vine; stem angled or grooved, ferruginous-pilose; leaves petiolate, blades ovate to broadly oval, 5-10 x 2-5.5 cm, firm, scabrid, pilosulous above, velvety ferruginous-pilose below, margin entire; inflorescence axillary; flowers 1 or 2, pedicellate; pedicels ferruginous-pilose; bracteoles green, oblong to oblong-lanceolate, 30-40 x 10 mm, ferruginous-pilose, awn-tipped apically; calyx inconspicuous; corolla red, 40-50 mm long, limb subequally 5-lobed, lobes 4-5 mm long, entire; fruit oblong-obovate, strongly compressed, brown-puberulent.

Widespread species from Colombia south to Bolivia in raised, non-inundated tropical evergreen forest on ridgetops in lowland plain and entering the Andean foothills.

Specimens examined: Pando: Abuná, *Gentry 77582* (MO, US); Suárez, *Fernández 8164* (MO). Beni: Ballivián, *Beck 16545* (LPB, US). La Paz: Tamayo, *Wood & Goyder 15379* (K, LPB, US); Sud Yungas, *Krukoff 10190* (MO, NY, US); Nor Yungas, *Gentry 44290* (MO, US), *Nee 30306* (MO, NY, US), *Solomon 8782* (MO); Caranavi, *Wood & Mondaca 14532* (K, LPB, US); Larecaja, Tipuani-Guanay, *Bang 1707* (BM, MO, NY, US), Guanay, *Grifo 764* (MO, NY, US); Mapiri, *Rusby 2405* (BM, NY, US), *Buchtien 1491* (US); Tipuani *Buchtien 5571* (US); Inglis-Inglis, *Williams 1494* (NY, US); Murillo, *Beck 2815* (LPB, US), *Solomon 9197, 10808* (MO, US), *12928* (MO). Cochabamba: Chaparé, *J. Steinbach 9288* (K); *R. Steinbach 528* (MO, US).

Mendoncia meyeniana Nees, in DC., Prodr. 11:51. 1847. - *Mendozia meyeniana* Nees, in Mart., Fl. Bras. 9(7):11. 1847. Type: Peru, *Meyen s.n.* (lectotype GZU, here chosen; photo US).

Woody vine; stem quadrangular to terete, appressed pubescent; leaves petiolate, blades ovate-oblong, 7-9 x 4-5 cm, firm, scabridulous, margin entire; inflorescence axillary; flowers 2-5 (usually 3) clustered and pedicellate; bracteoles green, ovate-oblong, 22-25 x 10-12 mm,

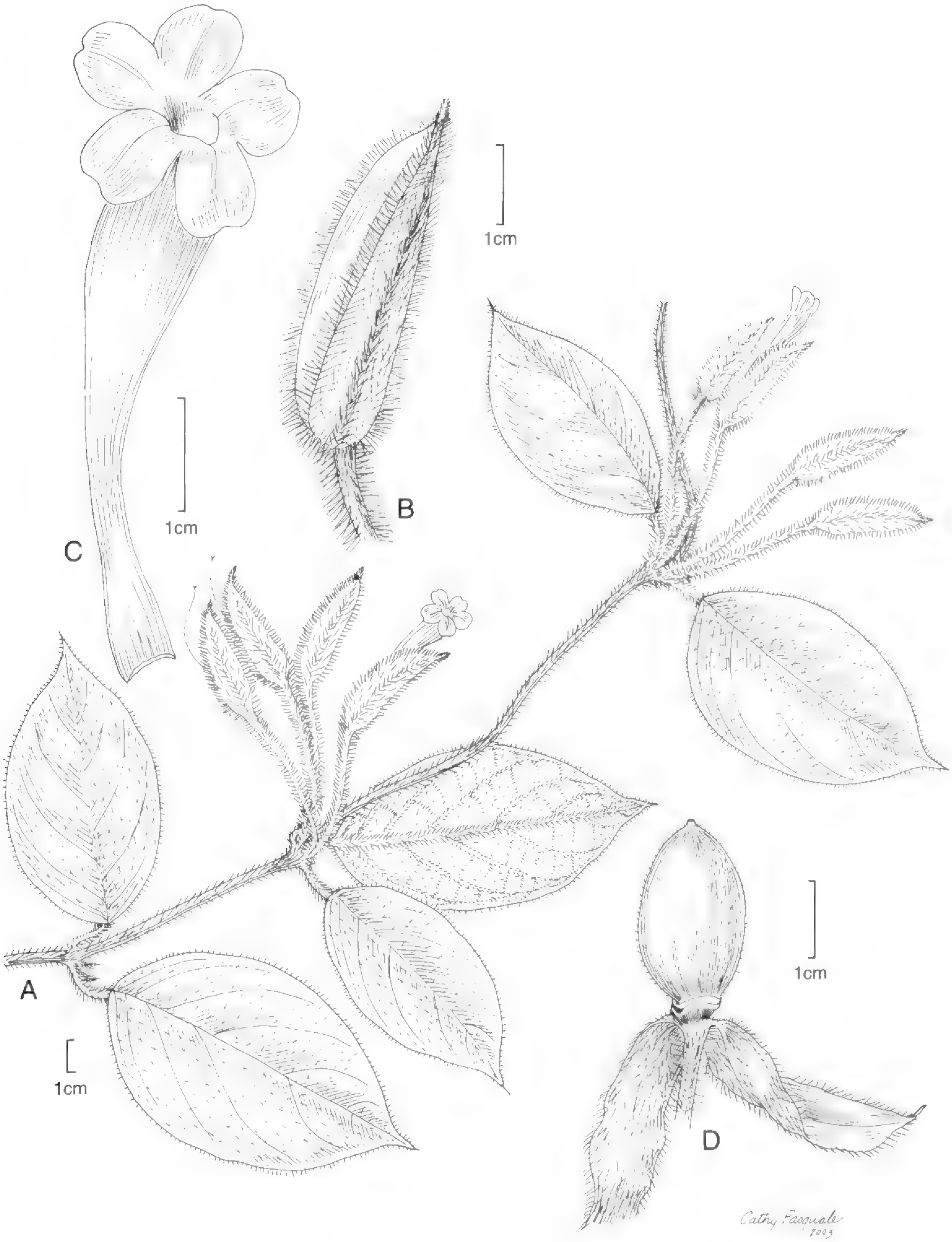


Fig. 21. *Mendoncia lindavii*. A. Habit. B. Bracteole. C. Corolla. D. Drupe and bracteoles. (A-B, from *A. Skutch 4480*, US; C, from *D. Wasshausen & Encarnacion 539*, US; D, *J. Steyermark et al. 120525*, US).

puberulous, apically obtuse and mucronulate, margin entire; calyx inconspicuous; corolla bright red, 25-30 mm long, limb subequally 5-lobed, lobes 3-4 mm long; fruit deep purple, oblong-ovate or oblong.

Occasional in primary and secondary moist forests on terra firma and gentle undulating terrain. Known from Peru, Bolivia and Amazonian Brazil.

Specimens examined: PANDO: Roman, *Vargas 91* (LPB, US); Suárez, *Sperling 6413* (NY, US), *Izawa 55* (MO, US). BENI: Vaca Díez, *Solomon 6105* (MO), *6470*, *7681* (MO, US), *Daly 2088* (MO, NY, US), *Boom 5008* (NY, US). SANTA CRUZ: Ichilo, *J. Steinbach 5547* (MO, NY). WITHOUT PRECISE LOCALITY: Bolivia, Moro, Jan 1866, *Pearce s.n.* (BM, K).

Mendoncia robusta Rusby, Mem. New York Bot. Gard. 7:361. 1927. TYPE: Bolivia, Beni, Ballivián, Rurrenabaque, *Cárdenas 808* (holotype NY; isotype US-1232254).

Yellowish herbaceous climber; stem quadrangular, stout, appressed-pubescent; leaves petiolate, blades ovate, 8-15 x 5-10 cm, thick, scabrellate with minute tufts, margin entire; inflorescence axillary; flowers 1-2, pedicellate; pedicels densely yellowish puberulous; bracteoles green, oval, 30 x 30 mm, densely yellowish puberulous, rounded or subtruncate and minutely mucronulate apically, margin entire; calyx inconspicuous; corolla (but one seen) dark red (fide Rusby), 55-60 mm long, limb subequally 5-lobed; fruit green, drying black, puberulous.

Occasional at forest edges, between 300 and 900 meters in elevation, in Peru and northern Bolivia.

Specimens examined: BENI: Ballivián, Rurrenabaque, *Cárdenas 1188* (K). COCHABAMBA: between Villa Tunari & Puerto Villarroel, *Fernández 7943* (MO).

20. **Nelsonia** R. Br.

Nelsonia canescens (Lam.) Spreng., Syst. Veg., ed. 16, 1:42. 1824. - *Justicia canescens* Lam., Tabl. Encycl. Meth., Bot. 1:41. 1791. TYPE: Senegal, *Roussillon 53* (holotype P-LA; isotype P).

Nelsonia albicans Kunth, Nov. Gen. & Sp. 2:234. 1818. TYPE: Colombia, Río Sinu near El Zapota, *Humboldt s.n.* (holotype P).

Nelsonia brunelloides (Lam.) Kuntze, Rev. Gen. Pl. 2:493. 1891. – *Justicia brunelloides* Lam., Tab. Encycl. 1:40. 1791. TYPE: Java. Fig. 22.

Perennial herb with trailing non-rooting stem from a central taproot, 10-30 cm high; younger stems pilose; leaves petiolate, blades ovate 1.5-11 x 2-3.5 cm, glabrous, glandular-punctate above, margin entire; inflorescence axillary and terminal, spikes of 3-many flowers; bract 1, subtending each flower, imbricate, ovate, 4-9 x 2-3.5 mm, pubescent with long filiform trichomes; bracteoles 0; calyx 4-lobed, pubescent with dense, long, thin, straight, many-celled, glossy eglandular trichomes, posterior lobe ovate, anterior lobe lanceolate, apically 2-dentate, lateral lobes lanceolate; corolla white, 7 mm long, glabrous, bilabiate, tube 3-6 mm long, limb ca. 2 mm wide, lobes 2.5-5 mm long; stamens 2; anthers 2-thecous, without trichomes or basal appendages, opening at base by a pore; capsule conical, beaked, seed-bearing only at base, lacking retinacula; seeds 8-28.

Pantropical weed.

Specimens examined: PANDO: 80 km SW of Cobija, Limoero, *Prescott 25* (LPB).

21. **Odontonema** Nees

Odontonema cuspidatum (Nees) Kuntze, Rev. Gen. Pl. 2:493. 1891.

Thyrsacanthus cuspidatus Nees, DC., Prodr. 11:323. 1847. TYPE: Mexico, Oaxaca, Sierra S. Pedro Nolasco, Talea, *C. Jürgensen 895* (lectotype K, Daniel 1995: 98). Fig. 23.

Shrub 1 m; stems subquadrangular, pilose, older stems glabrate; leaves petiolate, blades elliptic to ovate, 9.5-15 x 4-6 cm, glabrous, margin entire to undulate; inflorescence a terminal raceme or panicle with 3 to many flowers in fascicles; pedicels 5-7 mm long, puberulent; bracts subulate, 1.5-4 x 0.5-1 mm, margin entire, ciliolate; bracteoles subulate, 1-1.5 x 0.5 mm, margin ciliolate; calyx 5-lobed, lobes subulate, 1.5-2 mm long, margin ciliolate; corolla red, tubular, 25-35 mm long, glabrous, weakly bilabiate, lower lip 3-lobed, lobes elliptic-ovate, ciliolate, upper lip 2-lobed, lobes elliptic-ovate, apically rounded;

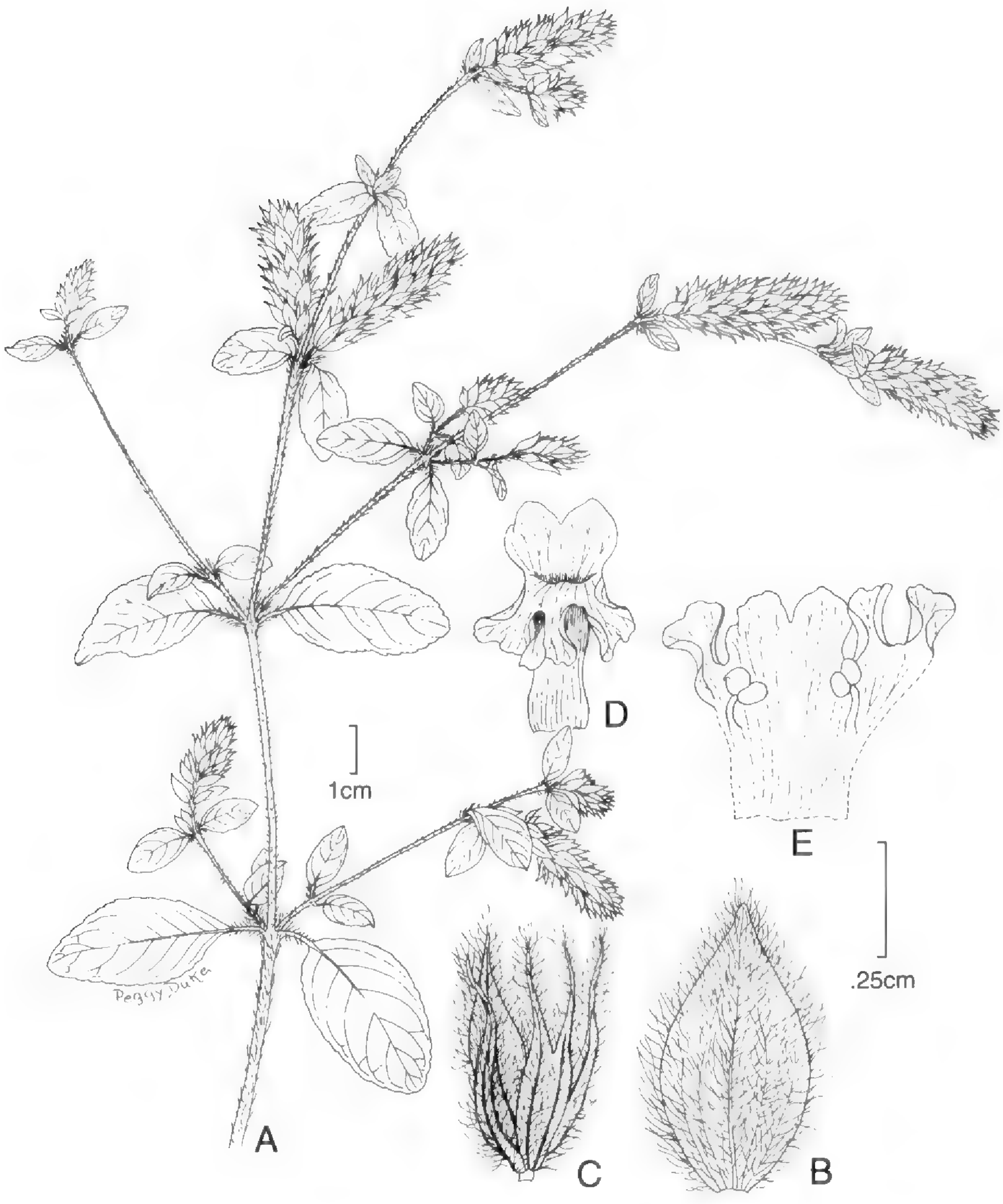


Fig. 22. *Nelsonia canescens*. A. Habit. B. Bract. C. Calyx lobes. D. Corolla. E. Corolla expanded. (From *H. Irwin & Soderstrom 5490*, US).

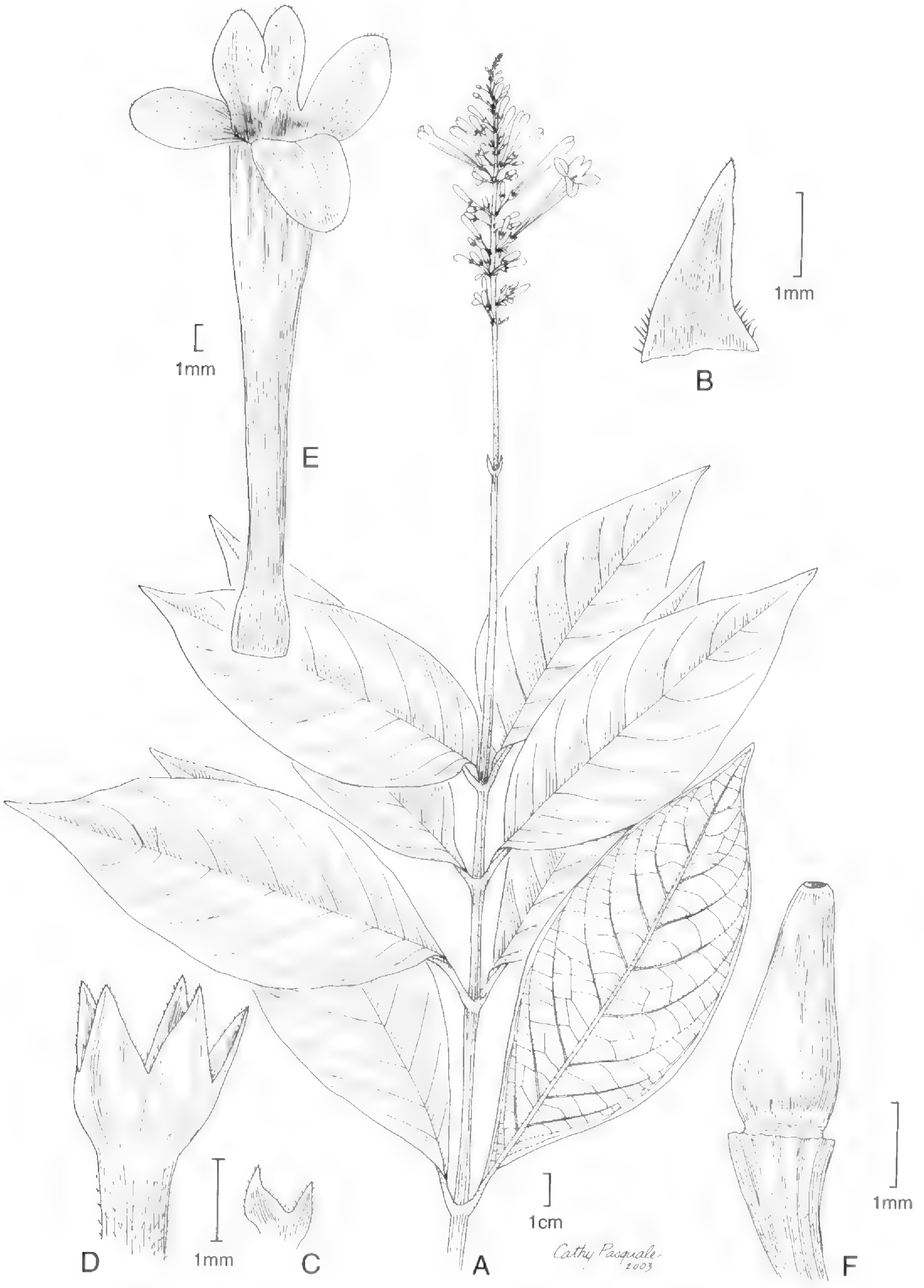


Fig. 23. *Odontonema cuspidatum*. A. Habit. B. Bract. C. Bracteoles. D. Calyx lobes. E. Corolla and stigma. F. Ovary. (A-E, from *A. Krapovickas & Schinini 31631*, US; F, from *J. Lau 1341*, US).

stamens 2, included; anthers 2-thecous, the thecae blunt at base; staminodes 2; capsule clavate, glabrous; seeds 4.

Native of Mexico but frequently cultivated in tropical areas. In Bolivia commonly grown in gardens in Santa Cruz and in small towns of Santa Cruz Department.

Specimens examined: SANTA CRUZ: Ichilo, Buena Vista, *R. Steinbach 829* (LPB, US); Ibáñez, Santa Cruz, Jardín Botánico, cult., *Krapovickas 31631* (CTES, MO, US); Florida, 2 km SE of Bermejo, cult., *Solomon 18008* (MO, US).

22. **Oplonia** Raf.

Oplonia jujuyensis Wassh. & C. Ezcurra, Novon 3:89. 1993. TYPE: Argentina, Jujuy, Ledesma, *Iudica & Ramadori 91* (holotype SI).

Illustration: 1993. Wasshausen & Ezcurra, Novon 3:90.

Branching shrub or subshrub to 1.5 m; stems erect, cylindrical; bark pale or copper-colored, exfoliating; leaves petiolate, blades elliptic-ovate, 4-10 x 3-4 cm, glabrous, membranous, margin entire or undulate; inflorescence in axils of upper leaf blades, 2-3 flowers in sessile dichasia, occasionally reduced to 1 flower subtended by 2 bracteoles; bracteoles triangular, small, 1-2 mm long; calyx 5-lobed, 3-4 mm long, lobes linear; corolla white, zygomorphic, 15 mm long, glabrous, tubular, tube 12 mm long, gradually expanded, limb erect, weakly bilabiate, lower lip 3-lobed, lobes 2.2-2.5 mm wide, upper lip deeply 2-lobed, lobes ovate to obovate, 3 x 1.6-2.2 mm, all lobes obtuse; stamens 2, included; anthers 2-thecous, muticous; staminodes 2, minute; capsule clavate, stipitate; seeds 2-4.

An inconspicuous and apparently rare but possibly overlooked shrub of seasonally dry forest from northern Argentina north to the Yungas of La Paz, with an almost identical distribution to *Schaueria azaleiflora* with which it sometimes grows. Possibly vulnerable within the IUCN classification. Flowers in the dry season from August to October.

Specimens examined: LA PAZ: Espía, head of Río Bopi, *Rusby 115* (NY). CHUQUISACA: Tomina, *Wood 12594* (K, US).

23. **Pachystachys** Nees

Herbaceous or suffrutescent plants; leaves large, petioled; spikes terminal, dense; bracts conspicuous, herbaceous; bractlets small or none; flowers borne in terminal spike of verticillasters consisting of 3 or 4 flowers each; calyx 5-lobed, the lobes relatively short; corolla ringent, slenderly obconic, curved, 2-lipped, lower lip 3-lobed, lobes subequal, oblong or ovate, upper lip narrow, 2-lobed apically; stamens 2, about as long as corolla, attached near base of tube; anthers deeply sagittate, the basal thecae muticous, equal; staminodes, if present, rudimentary; capsule 4-seeded. Neotropical genus of 12 species. Occurring along edges of the lowland rain forest at relatively low elevations (below 1000 meters) from the West Indies southward to Peru and Bolivia and eastward to French Guiana and Amazonian Brazil. Species of *Pachystachys* are perhaps best known for their ornamental beauty and many may be found in botanical gardens throughout the warmer regions of the world.

Key to the species of **Pachystachys**

1a. Corolla white; bracts bright yellow or orange-yellow ..... *P. lutea*
1b. Corolla crimson, scarlet, becoming orange-red with age 2

2a. Calyx lobes lanceolate, 5 x 1.5 mm; bracts green with purple tips; corolla puberulous and glandular-punctate ..... *P. ossolae*
2b. Calyx lobes narrowly triangular, 3 x 1 mm; bracts entirely green; corolla glabrous to sparingly hirtellous .... *P. spicata*

Pachystachys lutea Nees, in DC., Prodr. 11:320. 1847. - *Justicia lutea* Ruiz & Pavon ex Schult. Mantissa 1:146. 1822, nom. nud. TYPE: Peru, Chicolaya, *Tafalla 345* (lectotype MA, here chosen; isolectotype G).

Erect, lax shrub 1.5-2.5 m; leaf blades oblong-lanceolate, membranous, glabrous, entire; inflorescence of a solitary, terminal spike; bracts densely imbricate, bright yellow or orange-yellow, ovate, glandular-pilose along entire margins; corolla white, pilose and glandular-punctate, limb bilabiate, lower lip spreading, ovate, upper lip erect, lanceolate, minutely bilobed.

Native to Peru, this species is commonly cultivated in the Bolivian lowlands and in greenhouses in temperate countries.

Pachystachys ossolae Wassh., Proc. Biol. Soc. Wash. 99(1):180. 1986. TYPE: Peru, Cuzco, Prov. Quispicanchis, *Wasshausen & Encarnacíon 729* (holotype US-2956710; isotypes USM, US). Fig. 24.

Suffrutescent shrub, 0.7-4 m; leaf blades elliptic to ovate, glabrous, entire; inflorescence solitary, terminal spike; bracts imbricate, green with purple at tips, oblanceolate, sparingly puberulous, margin entire, ciliate; corolla crimson, puberulous and glandular-punctate, limb bilabiate, lower lip spreading, lobes oblong to narrowly ovate, upper lip erect, minutely bilobed.

Occasional along edge of lowland rain forest and found only in Peru and the very north of Bolivia. Flowers in the dry season from July to September.

Specimens examined: LA PAZ: Iturralde, Río Satariapo, *Gentry 70849* (MO); Puerto Muscoso, *Helme 854, 855* (LPB, US); near Ixiamas, *Wasshausen & Wood 2175* (CAS, GOET, K, LPB, NY, US), *Wood & Wasshausen 13820* (K, LPB).

Pachystachys spicata (Ruiz & Pav.) Wassh., Proc. Biol. Soc. Wash. 99(1):175. 1986.- *Justicia spicata* Ruiz & Pav., Fl. Peruv. & Chil. Prodr. 1:8. pl. 9. 1798. TYPE: Peru, *Ruiz & Pavón s.n.* (holotype MA; F photo 29185).

Pachystachys riedeliana Nees, in Mart., Fl. Bras. 9(7):99. 1847. TYPE: Brazil, Amazonas, Borba, *Riedel s.n.* (holotype LE; frag. GZU).

Suffrutescent; leaf blades oblong, elliptic or broadly oblanceolate, entire; inflorescence of a solitary, terminal spike; bracts imbricate, green, ovate-lanceolate, puberulous, margin entire; corolla scarlet, becoming orange-red with age, glabrous to sparingly hirtellous, limb bilabiate, lower lip spreading, linear, upper lip erect, minutely bilobed.

Widespread in tropical America from the West Indies south to northern Bolivia and Amazonian Brazil at the edges of lowland rain forest and along trails or river banks at elevations between 150 and 700 meters. Flowers in the dry season from July to September.

Specimens examined: PANDO: Román, *Prance 5695* (K, NY, US), *6499* (NY, US), *Solomon 17100* (MO), *17156* (LPB, MO); Abuná, *Vargas 643* (LPB), *643-B* (LPB, US), *Beck 19292* (LPB); Madre de Dios, *Killeen 4009* BENI: Yacuma, *Beck* 16717 (K, LPB, US). LA PAZ: Sud Yungas, *Krukoff 10236* (MO, NY, US); Iturralde, Moraes 307 (LPB, US), *Wood & Wasshausen 13810* (K, LPB, US); Tamayo, *Kessler 3860* (LPB, US); Larecaja; Mapiri, *Buchtien 1472* (US), *Bang 1555* (BM, K, MO, NY, US). COCHABAMBA: Chapare, *R. Steinbach 429* (NY, US); Carrasco, *Beck 13709* (LPB, US); Incachaca - S. Antonio, *Werdermann 2125* (MO). WITHOUT PRECISE LOCALITY: Bolivia, *Pearce 4168* (K).

24. **Pranceacanthus** Wassh.

Pranceacanthus coccineus Wassh., Brittonia 36:1. 1984. TYPE: Brazil, Rondônia, basin of Rio Madeira, *Prance 5401* (holotype INPA: isotypes GH, K, MO, NY, US-2559611, VEN). Fig. 25.

Woody herb, subshrub or shrub 0.8-2.5 m; stems subquadrangular, ascending, hirtellous; leaves petiolate, blades oblong-elliptic to oblong-lanceolate, 15-20 x 4.5-7.5 cm, firm, glabrate, margin entire or undulate; inflorescence terminal and axillary, pedunculate unilateral spikes; peduncle glandular-puberulous; bracts and bracteoles green, subequal, lanceolate, glandular-puberulous, margin entire, ciliate; bracts 11-12 x 1.5 mm; calyx 5-lobed, 9 mm long, lobes equal; corolla bright red, 35 mm long, puberulous, tube slender, limb 2-lipped, lips erect, subequal, 4 mm long, lower lip 3-lobed nearly to base, upper lip 2-lobed, emarginate at apex; stamens 4, didynamous; anthers of anterior (longer) pair 2-

Fig. 24. *Pachystachys ossolae*. A. Habit. B. Bract, bracteoles and calyx. C. Corolla and exserted stamens. D. Corolla expanded, showing attachment of filaments. (From *D. Wasshausen & Encarnacion 729*, US).

Fig. 25. *Pranceacanthus coccineus*. A. Habit. B. Bracts, calyx and gynoecium. C. Corolla. D. Bracts and calyx enlarged. E. Corolla expanded. (A, from *C. Calderón et al. 2787*, US; B-E, from *G. Prance et al. 5167*, US).

thecous, thecae equally and somewhat obliquely attached to connective, anther of posterior (shorter) pair 1-thecous, all basally muticous; capsule clavate, drying brownish; seeds 4.

Occasional in forest near streams on "terra firma" in the SW Amazon basin of Bolivia and Brazil.

Specimens examined: PANDO: Roman, *Vargas 850* (LPB, US), *Solomon 17105* (LPB, MO).

25. **Pseuderanthemum** Radlk.

Pseuderanthemum congestum (S. Moore) Wassh., Dubs Prodr. Fl. Matogrossensis Ser. B, part 1:3. 1998. Betrona-Verlag, Küsnacht/ Switzerland. - *Eranthemum congestum* S. Moore in Trans. Linn. Soc. Ser. II. 4:428. 1895. TYPE: Brazil, Mato Grosso, Rio Jangada, *S. Moore 264* (holotype BM).

Pseuderanthemum bolivianum Britton ex Rusby, Bull. Torrey Bot. Club 27:183. 1900. TYPE: Bolivia, Pando, Madre de Dios, junction of Rivers Beni and Madre de Dios, *Rusby 1166* (holotype NY; isotypes K, US-1320519). Fig. 26.

Herb or subshrub 10-50 cm; stem woody from elongated rhizomes, ascending; bark reddish, exfoliating; leaves crowded apically, sessile, blades lanceolate or ovate-lanceolate, 3.5-7 x 0.75-2.5 cm, puberulous, thin, margin entire; inflorescence of dichasia in upper leaf axils, 1-3-flowered, pedunculate, subtended by reduced cauline leaves; bracts inconspicuous, opposite, green, margin entire; bracteoles 2, linear-lanceolate, pubescent; pedicels subequal in length; calyx deeply 5-lobed, lobes equal, linear, 5-6 mm long, pubescent; corolla purplish-blue or violet, ± salverform, tube cylindric, 14-15 mm long, puberulous, limb subactinomorphic to bilabiate, erect or abruptly spreading, lobes 5.5-10 mm long, obtuse; stamens 2, included; anthers 2-thecous, lacking basal appendages; staminodes 2, minute, filiform; capsule stipitate, head ellipsoid; seeds 4.

Most typically a plant of tracksides in seasonally dry forest on the Pre-Cambrian Shield of Bolivia and Brazil but occurring sporadically over a wider area in both countries. Flowers during the dry season from June to October.

Specimens examined: BENI: Ballivián, *Beck 5183, 5619* (LPB, US). LA PAZ: Sur Yungas, Huachi, *White 971* (K). SANTA CRUZ: Velasco, *Guillén 3962* (US, USZ), *Wasshausen & Wood 2237* (CAS, GOET, K, LPB, US); Ñuflo de Chávez, *Beck 12301* (LPB, US), *Wood 10010, 12552* (K, LPB, US); Chiquitos, *Cutler 7010* (US), Vargas 3323 (US, USZ), *Wood 17281* (K, LPB, US); Ichilo, *J. Steinbach 6442, 7184* (BM, K, MO, NY).

26. **Pulchranthus** V. M. Baum, Reveal, & Nowicke

Pulchranthus adenostachyus (Lindau) V. M. Baum, Reveal, & Nowicke, Syst. Bot. 8(2):215. 1983.- *Odontonema adenostachyum* Lindau, Bull. Herb. Boiss., ser.II, 4:404. 1904. TYPE: Peru, Loreto, near Yurimaguas, *Ule 6287* (holotype B, destroyed; F photo 8731; isotypes G, K).

Illustration; 1983. Baum, Reveal & Nowicke, *Pulchranthus* (Acanthaceae), a New Genus from Northern South America, *Systematic Botany* 8:216.

Herbaceous, 30-60 cm; stems terete with red, exfoliating bark, glabrous; leaves petiolate, blades elliptic to elliptic-ovate, 6.3-23 x 2.2-9.8 cm, glabrous, margin obscurely crenate; inflorescence a crowded terminal raceme to panicle with 2-6 flowers per node, rachis glandular-puberulent; pedicels 2.5-4 mm long; bracts narrowly triangular, 2-4 x 0.5-1 mm; bracteoles 2, 1-3 x 0.5-1 mm, all margins ciliolate; calyx 5-lobed, lobes narrowly triangular, 3-7 x O.5-1 mm, glandular-puberulent; corolla lilac with darker spots on limb, 10-20 mm long, strongly bilabiate, glandular, tube short, broad and curved, white to cream to blue or violet, 3-5 mm long, lower 3 lobes elliptic to ovate 5-10 x 2-4 mm, ciliate and purplish-spotted, upper 2 lobes oblong-elliptic, 6-10 x 1.5-3 mm; stamens 2, exserted; anthers 2-thecous, muticous at base; staminodes 2, apically pubescent; capsule clavate, 20-25 mm long; seeds 4.

Occasional in lowland, terrae firma rain forest in the Amazon Basin from Colombia south to Bolivia and Brazil.

Specimens examined: PANDO: Román, *Solomon 17103* (MO); Madre de Dios, *Rueda 957* (MO, US), *Killeen 4531* (LPB, MO, US); Suárez, *Gonzales 21, 64* (LPB, US). COCHABAMBA: Carrasco, Valle de Sacta, *Cornejo 13* (U).

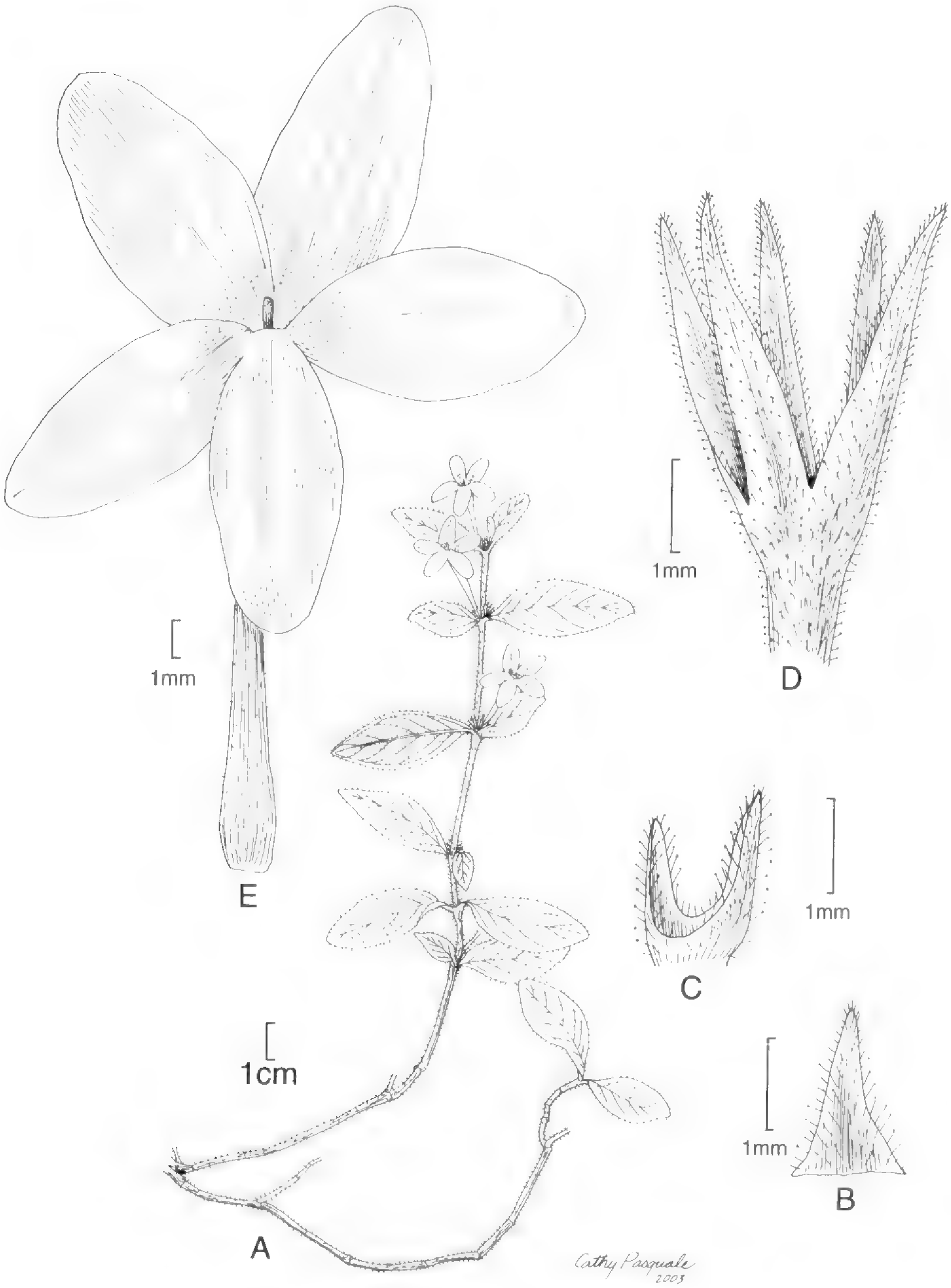


Fig. 26. *Pseuderanthemum congestum*. A. Habit. B. Bract. C. Bracteoles. D. Calyx lobes. E. Corolla. (From *St. Beck 5619*, US).

27. **Ruellia** L.

Perennial herbs or shrubs, sometimes with long, thin tuberous roots; leaves petiolate, blades elliptic, ovate-lanceolate, oblong-spathulate, apically acuminate or obtuse, margin entire, slightly undulate or repand-crenulate; inflorescence an axillary, long-pedunculate dichasium or cyme, or 1 or 2 (3) ± sessile, occasionally long-pedicellate flowers in the upper axils combined into a terminal raceme or spike; flowers usually large and showy, regular, sometimes curved; bracts one or absent; bracteoles 2; calyx usually 5-lobed, lobes narrow, mostly equal; corolla red, yellow, white, or purple (usually mauve), funnelform or salverform, contorted in bud, spreading in flower, sometimes saccate, tubular at base, widened and campanulate into throat, limb of 5 equal, obtuse, spreading lobes; stamens 4, didynamous, inserted at top of corolla tube; filament pairs connected at base by a membrane; anthers 2-thecous, the thecae equal, muticous at base; disk annular; ovary with 4-13 superposed ovules per locule; stigma lobes flattened, unequal; capsule oblong or clavate, exploding violently on exposure to water, retinacula remaining attached to capsule wall at maturity; seeds discoid, glabrous when dry, covered or rimmed with sticky mucilaginous trichomes when moistened. One of the largest genera in the family with approximately 250 species of perennial herbs and shrubs with a pantropical distribution. The genus exhibits large and usually showy flowers borne either singly or in various inflorescence forms.

Key to the Species of **Ruellia**

1a. Inflorescence a terminal spike of imbricate flowers; corolla pure white ..... *R. proxima*
1b. Inflorescence varied but never a terminal spike with imbricate flowers; corolla red, blue, pink, yellow or white 2

2a. Corolla red (pink, yellow or purple only in rare forms of *R. haenkeana*); inflorescence in pedunculate cymes except sometimes in *R. sanguinea* 3
2b. Corolla blue, white, pink or yellow-green; inflorescence various, paniculate or flowers sessile or subsessile in leaf axils, rarely in pedunculate cymes 10

3a. Corolla tube 40-60 mm long; lobes > 5 mm long; anthers strongly exserted 4
3b. Corolla tube < 40 mm long; lobes < 5 mm long; anthers included or very shortly exserted 5

4a. Corolla tube gradually widened from base, not venticose; plant an erect perennial ..... *R. haenkeana*
4b. Corolla tube strongly ventricose, widest in middle; plant a scrambling perennial ..... *R. inflata*

5a. Flowers subsessile in leaf axils of main stem or borne on short, leafy shoots, calyx characteristically hidden by leaves; corolla scarcely ventricose ..... *R. sanguinea*
5b. Flowers borne on axillary branches devoid of leaves or leaf-like bracts; corolla distinctly ventricose except in *R. pearcei* 6

6a. Leaves narrowly linear-lanceolate, < 1 cm wide ..... *R. gracilis*
6b. Leaves broadly oblong, ovate or lanceolate, at least 2 cm wide 7

7a. Calyx lobes glabrous, narrowly linear-oblong, acute or obtuse at apex, usually > 10 mm long at anthesis; corolla lobes often dull violet ..... *R. longipedunculata*
7b. Calyx lobes pubescent or glabrous, long attenuate from base, < 10 mm long at anthesis; corolla lobes always red 8

8a. Corolla 30-40 mm long, scarcely ventricose, gradually widened from base; leaves narrowly oblong-elliptic, glabrous, often violet beneath ..... *R. pearcei*
8b. Corolla < 20(-25) mm long, abruptly ventricose from a shortly cylindrical base; leaves variable but commonly ovate or elliptic, not violet beneath 9

9a. Leaves softly pubescent, ovate, at least 5 cm wide; inflorescence hirsute ..... *R. ruiziana*
9b. Leaves glabrous to thinly pubescent, variable in shape, < 5 cm wide; inflorescence glabrous to thinly pubescent ..... *R. brevifolia*

10a. Woody liana with stems to 10 m in height; corolla yellow-green ..... *R. beckii*
10b. Erect or decumbent herbs or undershrubs, sometimes woody below; corolla blue, lilac, white or pink 11

11a. Flowers in open, leafless panicles or cymes 12
11b. Flowers solitary or clustered, axillary or terminal, sessile or pedunculate but never in open, leafless panicles 16

12a. Low, acaulescent herb with leaves clustered in a rosette ..... *R. hygrophila*
12b. Erect or ascending herb with cauline leaves 13

13a. Leaves ovate, pubescent 14
13b. Leaves linear-lanceolate or oblong-lanceolate, glabrous 15

14a. Corolla white, the cylindrical part of the tube 35-50 mm long; leaves densely white-pubescent beneath ..... *R. macrosolen*
14b. Corolla blue, the cylindrical part of tube ca. 10 mm long; leaves sticky glandular-pubescent beneath but not white ..... *R. ciliatiflora*

15a. Inflorescence terminal; calyx white-pilose ..... *R. nitida*
15b. Inflorescence essentially axillary but cymes sometimes aggregated to form a terminal panicle; calyx glabrous or shortly glandular-pubescent ..... *R. tweediana*

16a. Plant with trailing stems and long pedunculate, blue flowers ..... *R. antiquorum*
16b. Erect herbs; flowers variously colored, sessile or very shortly pedunculate 17

17a. Flowers in axillary clusters; corolla small 18
17b. Flowers axillary or terminal, but, if axillary, solitary in each leaf axil; corolla relatively large 19

18a. Calyx glandular-pilose; leaves ovate ..... *R. filicalyx*
18b. Calyx shortly puberulent; leaves oblong-lanceolate ..... *R. menthoides*

19a. Cylindrical portion of corolla more than half length of corolla; corolla white, pink or lilac 20
19b. Cylindrical portion of corolla less than half corolla length; corolla blue 24

20a. Calyx ± naked, longer than bracts and bracteoles 21
20b. Calyx shorter than and concealed by bracts 22

21a. Corolla pink; stem white-pilose ..... *R. dolichosiphon*
21b. Corolla white with lilac markings; stem glabrous ..... *R. glischrocalyx*

22a. Corolla pure white, tube 50-80 mm long ..... *R. nobilis*
22b. Corolla pink or lilac, tube less than 50 mm long 23

23a. Bracts lanceolate, much longer than broad; leaves greenish beneath, 2.5-4 cm wide ..... *R. puri*
23b. Bracts ovate, about as broad as long; leaves whitish beneath, mostly 4-6 cm wide ..... *R. yurimaguensis*

24a. Leaves glabrous 25
24b. Leaves pubescent 26

25a. Calyx concealed by bracts, one lobe free, others forming two partially connate pairs; inflorescence terminal ..... *R. erythropus*
25b. Calyx naked, subequally 5-lobed to base, bracts absent; inflorescence axillary ..... *R. bulbifera*

26a. Corolla < 25 mm long; leaves pubescent, oblong-lanceolate, < 20 mm wide ..... *R. geminiflora*
26b. Corolla > 40 mm long; leaves pilose, obovate, > 20 mm broad ..... *R. brachysiphon*

Ruellia antiquorum Wassh. & J. R. I. Wood, Proc. Biol. Soc. Wash. 116:269. 2003. TYPE: Bolivia, Santa Cruz, Florida, Samaipata, on hill by radio transmitter, 1700 m, 17 Feb 1995, *J. R. I. Wood 9419* (holotype K; isotypes LPB, US-3348617). Fig. 27 (A-C).

Low perennial herb from a woody rootstock; stems to 25 cm long, trailing, pilose, becoming slightly woody when old, occasionally sending down adventitious roots from leaf nodes; leaves shortly petiolate, blades ovate to elliptic, sparsely to densely pilose, 1.4-3 x 0.5-2.2 cm; inflorescence of solitary, pedunculate flowers borne in axils of upper leaves, in each leaf pair, one axil fertile and one sterile; peduncles slender, glabrous, 1.5-5 cm long; bracteoles paired, borne 1-2 mm below flowers, linear-oblong, 9-10 x 0.75-1 mm, sparsely ciliate; calyx 1.4-1.7 mm long, lobes narrowly elliptic, acute, glabrate; corolla funnel-shaped, 55-70 mm long, ca. 2 mm wide at base, cylindrical for 25-30 mm, then gradually widened to 18-28 mm at mouth, tube dirty whitish-brown, pubescent without, lobes blue, glabrous, spreading, broadly ovate to suborbicular, rounded, 10-16 x 15-20 mm; anthers included in corolla tube; capsule narrowly obovoid, 10-15 x 4 mm, glabrous, gland-dotted.

A very local endemic species of the Samaipata area growing in rough, open, occasionally burnt grassland on sandstone hills between 1200 and 1800 m. The existence of this species is strong evidence that the grasslands in this area are of ancient, natural origin. Although very local, the species does not appear to be vulnerable. It flowers throughout the year but especially after rain.

Specimens examined: SANTA CRUZ: Florida, *Beck 6769* (LPB, US), *Rojas & Vargas 1994* (BOL), *Wood 8376* (K, LPB), *8630* (K, LPB, US), *10561* (K, LPB).

Ruellia beckii Wassh. & J. R. I. Wood, Proc. Biol. Soc. Wash. 116:271. 2003. TYPE: Bolivia, La Paz, Caranavi, 20 km along road from Caranavi to Carrasco, 1200 m, 1 Jul 1983, *S. G. Beck 9298* (holotype US-2983914; isotype LPB). Fig. 28 (A-D).

Woody liana reaching 10 m in height; stems woody, glabrescent; leaves shortly petiolate, blades broadly oblong-elliptic, 6-14 x 3-6 cm, tapering at both ends, glabrous; inflorescence a small, terminal subumbelliform cyme, branches arising in opposite pairs, branches scurfy-pubescent; bracteoles ovate-triangular, glabrescent, 4-8 x 2-3 mm; calyx lobes 12-14 x 5-6 mm, oblanceolate to obovate, imbricate, glabrous; corolla ca. 38 mm long, tube ca. 7 mm wide at base, bulbous, then gradually narrowed to 4 mm at 13 mm above base, then abruptly widened to ca. 14 mm, shortly glandular pubescent without, lobes broadly oblong, yellow-green, rounded, 7 x 6.5 mm; anthers exserted 10-15 mm beyond mouth of corolla.

Known only from the type locality where it was growing in hill forest. Further search has failed to refind this species in an area with much forest destruction and the species clearly very rare, if not actually extinct.

Ruellia brachysiphon (Nees) Benth. & Hook. f. ex Hiern, Kjoeb. Vidensk. Meddel. 73: 1877-78. - *Dipteracanthus brachysiphon* Nees, in Mart., Fl. Bras. 9:34. 1847. TYPE: Brazil, Rio Grande do Sul, Porto Alegro, *Sellow 68* (holotype B, destroyed; isotypes K, US-1234071).

Suffrutescent erect to decumbent herbs, 50 cm, from a tuberous base; stems subquadrangular, pubescent with pilose trichomes; leaves sessile or shortly petiolate, blades ovate to obovate, 3-6 x 2-2.5 cm, upper apically acute, lower ± obtuse or rounded; inflorescence densely pubescent, white-tomentose or densely velutinous with white or sordid glandular pilose trichomes; flowers sessile or subsessile, geminate or solitary in axils of terminal leaves; bracteoles linear to lanceolate to spathulate, shorter than calyx lobes; calyx lobes linear, densely glandular pilose; corollas purple or lilac-colored, 35-50 mm long, tube 12-18 mm long, throat 15-20 mm long, lobes orbicular, 12-14 x 7-9 mm, apically retuse; capsule obovoid, minutely puberulous.

A characteristic species of open, grassy cerrados on sandy soil in Eastern Bolivia, Paraguay

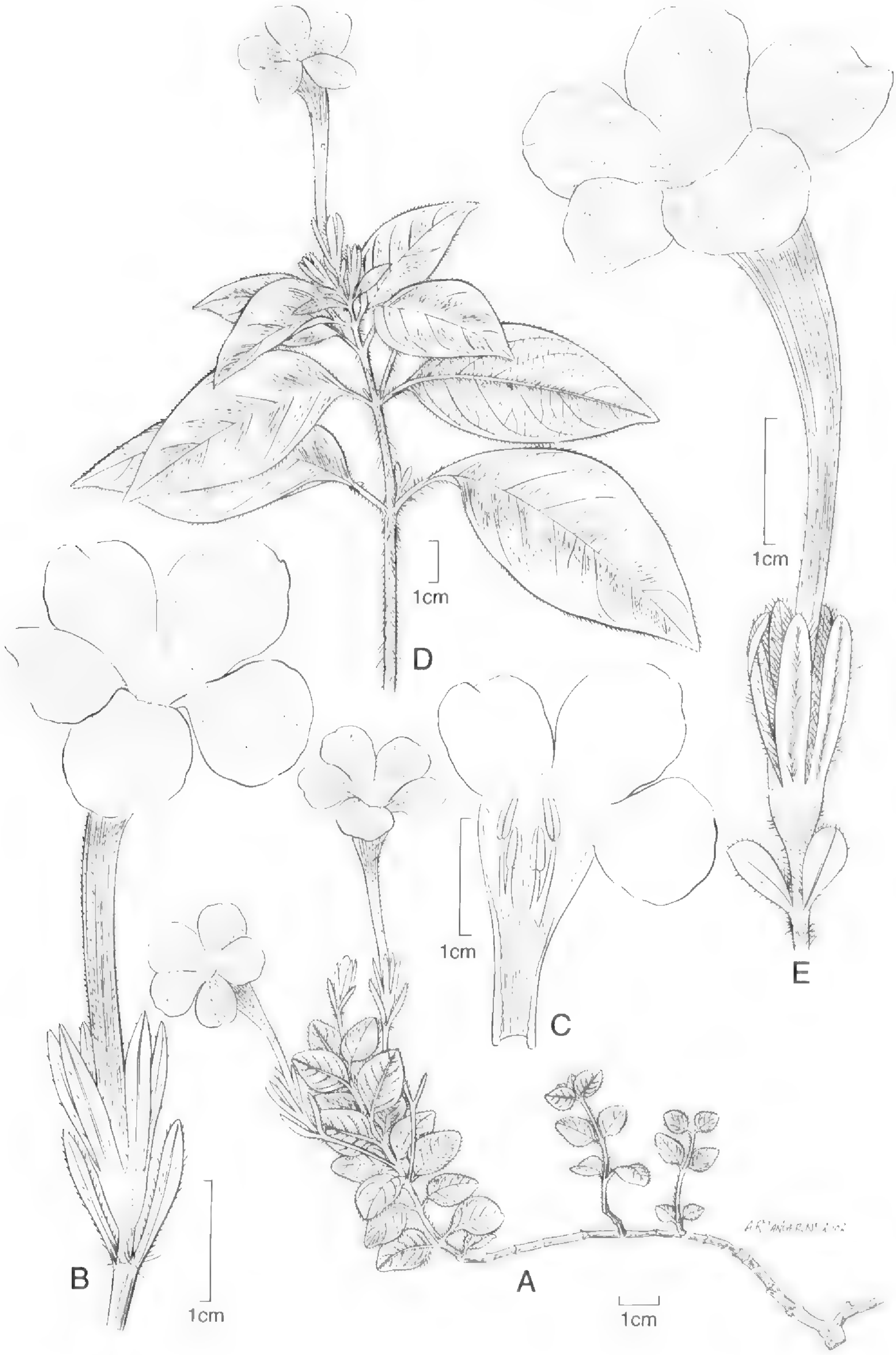


Fig. 27. A-C. *Ruellia antiquorum*. A. Habit. B. Pedunculate flower. C. Corolla expanded and stamens. D-E. *Ruellia dolichosiphon*. D. Habit. E. Bracteoles, calyx lobes and corolla. (A, B, from *J.R.I. Wood 9419*, US; C, from *S. Beck 6769*, US; D, E, from *J. Balcazar, Montero & Alvarez 2422*, USZ).

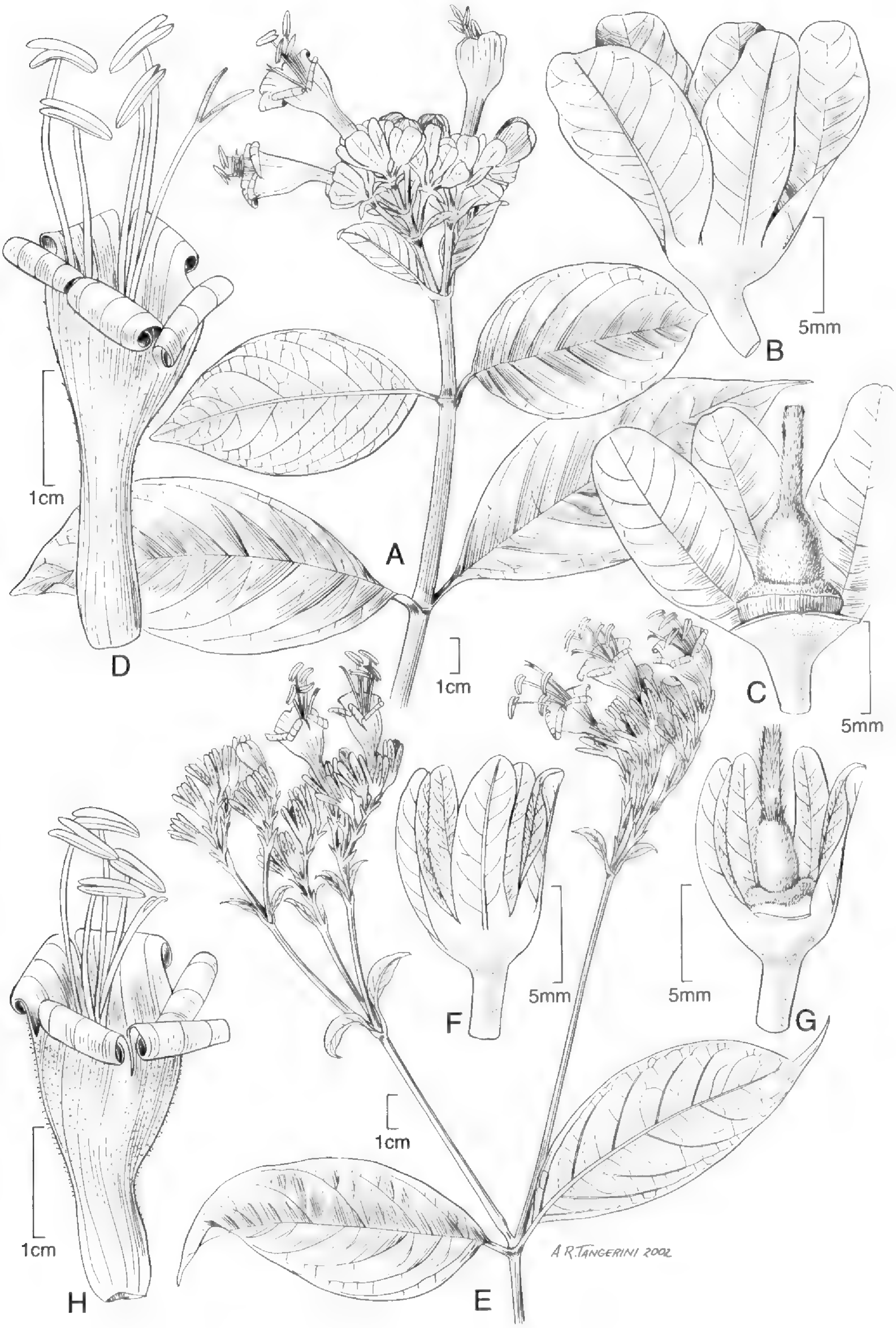


Fig. 28. A-D. *Ruellia beckii*. A. Habit. B. Calyx lobes. C. Calyx lobes, disc and ovary. D. Corolla, stamens, style and stigma. E-H. *Ruellia exserta*, occurs in Pará, Mato Grosso, and Territory Rondônia, Brazil, has not been found in Bolivia, included for comparison with R. beckii. E. Habit. F. Calyx. G. Calyx lobes, disc and ovary. H. Corolla, stamens, style and stigma. (A-D, from *S. Beck 9298*, US; E-H, from *R. R. de Santos et al. 1798*, US).

and Brazil. It flowers intensively after burning and the first spring rains in September-November but also sporadically in almost any season.

Specimens examined: Santa Cruz: Velasco, *Thomas 5642B* (NY), *Killeen 5940* (MO, US); Chiquitos, *D'Orbigny 999* (P), *Wood 17305* (K, LPB, US), *Wood & Guzman 17451* (K, LPB, US).

Ruellia brevifolia (Pohl) C. Ezcurra, Darwiniana 29:278. 1989. - *Stephanophysum brevifolium* Pohl, Pl. Bras. Icon. Descr. 2:84, tab. 155. 1831. Type: Brazil Rio de Janeiro, *Schott s.n.* (holotype W).

Ruellia ventricosa Kunth, Nov. Gen. Sp. 2:241. 1817, non Poiret 1804. - *Stephanophysum ventricosum* (Kunth) Nees, in DC., Prodr. 11:203. 1847. Type: Peru, Prov. Jaen de Bracamoros, Chamayae prope Chavico, *Humboldt & Bonpland s.n.* (holotype B, destroyed; F photo 18410; isotype P).

Stephanophysum longifolium Pohl, Pl. Bras. Icon. Descr. 2:85, tab. 156. 1831. - *Ruellia longifolia* (Pohl) Griseb., in Abh. Königl. Ges. Wiss. Göttingen 24:260. 1879, non Richard 1782. - *Ruellia graecizans* Backer, Brittonia 3:85, 87. 1938. Type: Brazil, Minas Gerais, Pirrahi, *Pohl 3027, 6038* (holotype W).

Echinacanthus dichotomus Kuntze, Rev. Gen. Pl. 2:489. 1891, non *Ruellia dichotoma* Sessé & Moc. 1889. Type: Indonesia, Java, Bogor, Buitenzorg, *Kuntze s.n.* (holotype NY).

Ruellia serratitheca Rusby, Mem. New York Bot. Gard. 7:362. 1927. Type: Bolivia, La Paz, Canamina, *Rusby 363* (holotype NY).

Stephanophysum macrandrum Bremek., in Proc. Konin. Nederl. Akad. Wetensch. s. C. 72, no. 4:424. 1969. Type: Bolivia, Chuquisaca, Siles, *Bartolo & Brooke 5681* (holotype U; isotype NY). Fig. 29 (E-H).

Suffruticose herb or subshrub to 1 m, with numerous erect stems, glabrous; leaf blades ovate, glabrous, apically acuminate; inflorescence axillary, lax, long-pedunculate, multiflowered cymes of compound dichasia; bracteoles ovate-lanceolate, foliaceous, exceeding calyx lobes; calyx puberulous; corollas curved, scarlet, to 30 mm long, tube 5-10 mm long, opening into an anteriorly inflated, ventricose throat, narrowed toward orifice, lobes suberect, small, rounded, 2-3 mm long, retuse; capsule clavate. This is a red-flowered, presumably humming bird-pollinated species.

Widespread in tropical and subtropical South America south to northern Argentina. In Bolivia it is abundant in and around seasonally dry forest up to 1500 m both in the Andean foothills and on the Pre-Cambrian Shield. Flowers from April to October.

Specimens examined: Pando: Suárez, *Gonzales 63* (LPB, US); Madre de Dios, *Solomon 17045* (MO, US), *Rueda 950* (MO); Manuripi, *Solomon 10881* (MO). Beni: Ballivián, *Beck 1691, 2517, 3458, 5805, 16433* (LPB, US); Reyes, *Rusby 1169* (NY, US), *Solomon 13949* (MO, US), *Smith 13200* (K, LPB, MO, NY, US); Rurrenabaque, *Daly 6488* (MO, NY, US), *Fournet 477* (US); Marban, *Solomon 8117* (MO, NY, US). La Paz: Sud Yungas, *Brooke 6546* (BM, NY); *D'Orbigny 470* p.p. (P), *Krukoff 10006* (K, MO, NY, US), *Beck 1665* (LPB, US), Millugnaya, *Buchtien 4018* (NY, US), *Vargas 2024* (LPB, US), *Seidel 2863, 4061* (LPB, US); Nor Yungas, *Seidel 1093* (LPB, US), *Solomon 8545* (MO, US); Inquisivi, *Lewis 88844* (LPB, MO), *88910* (LPB, MO, NY, US); Larecaja, Sorata, *Mandon 300* bis (P); Guanay, *Mandon s.n.* (P); *Rusby 2426* (NY, US), Guanay-Tipuani, *Bang 1390* (BM, K, NY, US); Mapiri, *Buchtien 1496* (US); Tamayo, Apolo, *Williams 1415* (BM, K, NY, US); Canamina, *Rusby 46* (K, NY, US). Santa Cruz: Velasco, *Killeen 5051* (MO, US, USZ), *Kuntze s.n.* (NY, US), *Seidel 86, 314* (LPB, US); Ñuflo de Chávez, *Wood 10003* (K, LPB, US); Chiquitos, *Weddell 3432, 3438* (P); *D'Orbigny 668* (P); *Jardim 2163* (US, USZ); Ichilo, *J. Steinbach 2965* (LIL, US), *7082* (BM, K, MO), *Nee 39249* (MO, NY, US), *Solomon 14082* (MO, NY, US); Ibáñez, *Lewis 37514* (LPB, MO, US); Florida, Angostura, *R. Steinbach 334* (MO, NY, US), Samaipata, *Cárdenas 3470* (BOLV, US), *Fosberg 28649* (K, NY, US), *Acevedo 4576* (NY, US), *Vargas 831* (MO); Vallegrande, *Kessler 5275* (LPB, US); Cordillera, *Cárdenas 4771* (BOLV, US), *Wood 14174* (K, LPB). Chuquisaca: Boeto/Tomina, *Muehlbauer s.n.* (US); Tomina, *Wood 12301* (K, LPB); Tomina/Siles, Bartolo, road from Monteagudo to Sucre, *Brooke 5681* (BM); Calvo, *Saravia 11582* (CTES, US). Tarija: Arce, *Solomon 9925* (MO, NY, US).

Ruellia bulbifera Lindau, in Engl. & Prantl, Nat. Pflanzenfam. 43(3b):311. 1895. - *Dipteracanthus tuberosus* Nees, in Mart., Fl. Bras. 9:42. 1847, not *Ruellia tuberosa* L. 1753. Type: Brazil, without locality, *Sellow s.n.* (holotype B, destroyed; isotype GZU).

Sprawling or decumbent herb, with stem to 30 cm long, from a woody rhizome with thick,

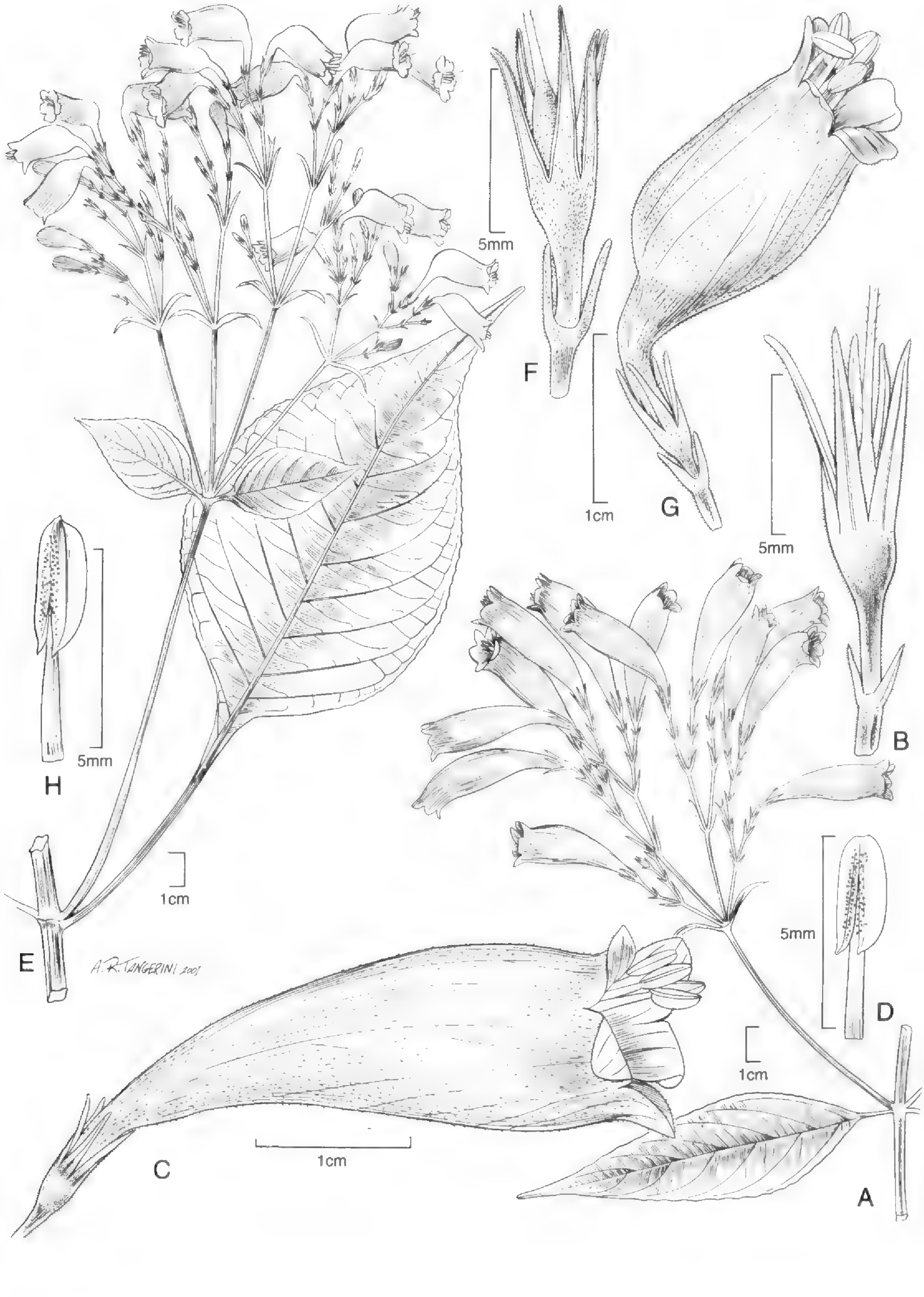


Fig. 29. A-D. *Ruellia pearcei*. A. Habit. B. Bracteoles and calyx lobes. C. Calyx lobes, corolla and stamens. D. Anther enlarged. E-H. *Ruellia brevifolia*. E. Habit. F. Bracteoles and calyx lobes. G. Bracteoles, calyx lobes, corolla and stamens. H. Anther enlarged. (A-D, from *D. Wasshausen et al. 2103*, US; E-H, from *M. Nee & Atha 50090*, US).

fleshy, fusiform roots; stems obscurely quadrangular, ± glabrate; leaves shortly petiolate, blades elliptic to widely oblong, 1.5-2.5 x 1-1.2 cm, glabrous and coriaceous, nitidulous, with dark, sessile glands and venation prominent below; flowers sessile, solitary in axils of terminal leaves; bracteoles absent or obsolete; calyx lobes linear, subulate; corolla blue or purplish white, 30-40 mm long, basal tube 7 mm long, throat 15-20 mm long, lobes orbicular, ca. 10 mm in diam.; capsule ovoid, glabrous; seeds 2-4. Closely related to the widely distributed and variable *Ruellia geminiflora*, from which it could have been derived, but is characterized by the completely glabrous, coriaceous leaves, generally rounded at the apex and by the thick, tuberculate xylopodium.

Locally frequent in open, seasonally burnt, grassy cerrados, usually on sandy soil in Eastern Bolivia, Brazil and Paraguay. Flowers after burning and rain, principally from September to December.

Specimens examined: SANTA CRUZ: Chiquitos, *D'Orbigny 399* (P), *Wood & Guzman 17390* (K, LPB, US); Warnes, *Menacho & Rodriguez 4346* (USZ), *Menacho et al. 328* (USZ), *Wood 9801* (K, US); Ibañez, Santa Cruz de la Sierra, *Herzog 1380 c 2* (L); Sara, *Wood 12760* (K, LPB, US), *Wood & Goyder 15750* (K, LPB, US). CHUQUISACA: Siles, Monteagudo, *Beck 9851* (LPB, US).

Ruellia ciliatiflora Hook., Bot. Mag. 66:tab. 3718. 1840. - *Arrhostoxylum ciliatiflorum* (Hook.) Nees, in DC., Prodr. 11:216. 1847. TYPE: based on fig. in tab. 3718 of Bot. Mag. 66. 1840.

Ruellia lorentziana Griseb., Abh. Königl. Ges. Wiss. Göttingen 24:259. 1879. SYNTYPES: Argentina, Tucumán, *Lorentz & Hieronymus 176* (syntypes CORD, GOET); Tucumán, *Lorentz & Hieronymus 1149* (syntypes CORD, GOET).

Perennial herb 30-80 cm, sparsely branched from a subligneous base; leaf blades ovate, markedly pubescent on nerves, surface pilosa and sometimes glutinose, margins shallowly crenate; inflorescence of dichasial cymes in the axils of reduced apical leaves, aggregated in an ample, terminal pyramidal thyrse, the whole appearing paniculate; bracts foliaceous; chasmogamous flowers tilted, blue-lilac, 35-45 mm long, basal tube angled at top, lobes spreading, obovate, anterior lobes with dark palate markings toward orifice; capsule elliptic, puberulous; seeds 16-24. Related to species of the *Ruellia nudiflora* complex from Mexico and southeastern North America and, even more closely to *R. macrosolen* from the chaco. This is a day-flowering, presumably bee-pollinated species with a blue corolla.

Widely distributed in subtropical South America, but especially in the western Chaco areas; in Bolivia a plant of open, dry bushland and poor dry, often somewhat disturbed grassland up to ca. 1300 m. Flowers during the rainy season from December to April.

Specimens examined: BENI: Cecado, *Wood 14138* (K, LPB, USZ). COCHABAMBA: Campero, *Antezana 606* (BOLV, US). SANTA CRUZ: Ñuflo de Chávez, *Saldias 1349* (NY); Chiquitos, *Mamani 1169* (MO, US); Santiesteban, *Nee 45119* (NY, US); Ibáñez, *Solomon 17955* (MO, US); Florida, *Schmitt 34* (MO, US); Mataral, *Cárdenas 5318* (BOLV, US), Pampa Grande, *Cárdenas 5596* (BOLV, K, US); Caballero, *Balcázar 96* (US, USZ); Cordillera, *Cárdenas 4718* (BOLV, US), *Beck 6479* (LBP, US), *Michel 13* (LPB, US), *Peredo s.n.* (LIL, US); Vallegrande, *Vargas 408* (MO). CHUQUISACA: Boeto, *Wood 10670* (K, LPB); Zudanez, *Wood & Serrano 13360* (K, LPB). TARIJA: O'Connor, *Wood & Goyder 16811* (K, LPB); Gran Chaco, Villamontes, *Herzog 1131* (L).

Ruellia dolichosiphon Wassh. & J. R. I. Wood, Proc. Biol. Soc. Wash. 116:273. 2003. TYPE: Bolivia, Pando, Manuripi, Communidad Lago, 17 km NE of Pursima on road to Chivé [5° 12' S, 57° 35' 81" W] 220 m, 29 Jun 2001, *J. Balcazar, J. C. Montero & J. Alvarez 2422* (holotype USZ). Fig. 27 (D-E).

Stout herb to 50 cm; stem rounded, densely white-pilose; leaves petiolate, blades ovate, 3.5-8.5 x 2.0-3.5 cm, apically acute, abruptly narrowed at base and attenuate onto petiole, sparsely white-pilose; inflorescence of short, terminal racemes; pedicels 2-4 mm long, glandular-pilose; bracts at base of pedicels 6-8 x 1-1.5 mm, subpetiolate, linear-oblanceolate, rounded, pilose; bracteoles 5-6 x 1-1.5 mm, linear-elliptic or linear-oblanceolate, pilose; calyx much longer than bracts, subequally lobed, lobes 20-22 x 4 mm, oblong-lanceolate, obtuse, one slightly larger than the others, ciliate and with a thick line of brownish trichomes along

midrib; corolla pale, probably sordid white, funnel-shaped, tube pubescent below, ca. 47 mm long, 4 mm wide at base, then narrowed to 1.5 mm after ca. 4 mm, before widening gradually to 6 mm at mouth, lobes ca. 8 mm long, ca. 15 mm wide, broadly ovate, acute, pink, subglabrous without.

Known only from the type collection in Amazonian rain forest in northern Bolivia. This rare species is presumably vulnerable within the IUCN classification although more data is needed to be certain.

Ruellia erythropus (Nees) Lindau, in Engl. & Prantl, Nat. Pflanzenfam. 4, Abt. 3b: 311. 1895. - *Siphonacanthus erythropus* Nees, in Mart., Fl. Bras. 9(7):47. 1847. TYPE: Brazil, Rio Grande do Sul, Porto Alegre, *Sellow s.n.* (holotype B, destroyed; F photo 5920; isotype K).

Blechum tweedii Nees, in DC., Prodr. 11:466. 1847. - *Ruellia tweedii* (Nees) T. Anders. ex Morong & Britton, Ann. New York Acad. Sci. 7:192. 1893. TYPE: Argentina, Parana ("Panama"), *Tweedie s.n.* (holotype K).

Ruellia pubiflora Griseb., Abh. Königl. Ges. Wiss. Göttingen 24:259. 1879. TYPE: Argentina, Salta, San José, Orán, *Lorentz & Hieronymous 550* (holotype GOET; isotype CORD).

Ruellia matogrossensis Lindau, Bull. Herb. Boiss., ser. I, 3:362. 1895. TYPE: Brazil, Mato Grosso, Jacobina, *Kuntze s.n.* (holotype B, destroyed; isotype NY).

Ruellia velascana Lindau, Bull. Herb. Boiss., ser. I, 3:363. 1895. TYPE: Bolivia, Santa Cruz, Velasco, *Kuntze s.n.* (holotype B, destroyed; F photo 18222; isotype NY).

Erect or straggling suffruticose perennial 20-60 cm, with a ligneous base and tough, fibrous root; stems decumbent, somewhat woody, glabrous; leaf blades petiolate, elliptic to ovate, glabrous, margin entire; inflorescence terminal, densely foliose spikes; flowers sessile, solitary in axils of upper leaves; calyx unequally cleft, two lateral lobes united to two lower ones, posterior free; corolla erect, blue, 25-35 mm, tube 15 mm long, throat campanulate-obconic, lobes spreading, orbicular; capsule ovate.

Frequent in subtropical South America in the understory of Chaco forest, adjacent seasonally dry forests and low scrub from southern Brazil through Paraguay to Bolivia and northern Argentina. There is a distant outpost in Mexico suggesting that the present-day distribution of this species considers of relics from wider distribution in the Pleistocene era. Flowers from April to August in the dry season.

Specimens examined: BENI: Ballivián, Espíritu, *Beck 5920* (LPB, US); Marbán, *Solomon 8173* (MO, US); Trinidad, *Werdermann 2356* (K, MO). SANTA CRUZ: Ñuflo de Chavez, *Quevedo 578* (MO), *Wasshausen & Wood 2267* (CAS, GOET, K, LPB, US), *Wood 10067* (K, LPB), *12550* (K, LPB, US); Chiquitos, *D'Orbigny s.n.* (P), *Weddell 3436* (P), *Wood & Mamani 13504* (K, LPB, US); Cordillera, Camiri Villa, *Badcock 225* (K); Camiri, on Río Parapetí, *Brooke 5558* (BM), *Michel 415* (LPB, US), *Wood 14175* (K, LPB, US); Ibáñez, *Kessler 5385* (LPB, US); Florida, *Wood 8686* (K, LPB), *Kessler 5453* (LPB, US); Vallegrande, *Kessler 5267, 5337* (LPB, US); Caballero, *Beck 7067* (LPB, US); *Wood 11100* (K, LPB); Ichilo, *J. Steinbach 7214* (BM, MO). CHUQUISACA: Zudañez, *Wood & Serrano 13341* (K, LPB, US); Tomina, *Wood 8416, 12585* (K, LPB, US). TARIJA: Gran Chaco, Villamontes, *Pflanz 4083* (US), *Krapovickas 19314* (US); Yacuiba, *Beck 11478, 11581, 11609* (LPB, US).

Ruellia filicalyx Lindau, Bull. Herb. Boiss., ser. I, 3:362. 1895. TYPE: Bolivia, Santa Cruz, Velasco, *Kuntze s.n.* (holotype B, destroyed; F photo 18411a; isotype NY).

Subshrub 0.5 m; stem terete, densely striolate, younger stem pilose, trichomes spreading; leaves petiolate, blades ovate 3-7 x 2.5-4 cm, apically acuminate, younger blades pubescent, older becoming glabrate, margin entire; inflorescence terminal, somewhat congested, 1-3 axillary branches; calyx lobes somewhat unequal, filiform, densely glandular-pubescent; corolla lilac, tube 14 mm long, upwards gradually enlarged, glabrous, lobes rounded.

A very rare, apparently endemic species of the northern Chaco fringes. Known from only one other collection that was made in Jujuy, Argentina. Conservation unknown because of lack of data but certainly rare and possibly threatened.

Specimens examined: SANTA CRUZ: Cordillera, *Vargas & Tapia 1042* (MO, US).

Ruellia geminiflora Kunth, Nov. Gen. Sp. quarto ed. 2:240. 1817 [1818]. - *Dipteracanthus geminiflorus* (Kunth) Nees, in Mart., Fl. Bras. 9(7):40. 1847. TYPE: Colombia, Tolima, Santa Ana & Ibague, *Humboldt & Bonpland s.n.* (holotype P; F photo 39431).

Ruellia elliptica Rusby, Bull. Torrey Bot. Club 27:74. 1900. TYPE: Bolivia, La Paz, Larecaja, Guanay, *Rusby 2562* (holotype NY).

Ruellia hypericifolia Rusby, Mem. New York Bot. Gard. 7:363. 1927. TYPE: Bolivia, Beni, Ballivián, Reyes, *Rusby 1322* (holotype NY).

Suffrutescent erect herb, with stems to 80 cm, from a terete woody rhizome less than 1.5 cm diam.; stems pubescent, densely white-arachnoid and hirsute at nodes; leaves shortly petiolate, blades elliptic, 2-5 x 1-2.5 cm, white-tomentose or densely velutinous; flowers sessile, geminate or solitary in axils of terminal leaves; bracteoles absent or obsolete; calyx lobes linear and subulate; corolla whitish tinted with purple, 30-40 mm long, tube ca. 10 mm long, throat 20-25 mm long, lobes orbicular, ca. 15 mm in diam.; capsule obovoid, puberulous; seeds 2-4. The plant is very variable in habit; plants from open grassy cerrados may be only a few centimeters high while those from overgrown, unburnt, scrubby grassland frequently exceed 50 cm in height.

Widely distributed in the savannas of South America; from Colombia and Venezuela to eastern Bolivia, southwestern and southeastern Brazil, Paraguay and northeastern Argentina. In Bolivia it is a plant of open, grassy cerrados and bushy grassland principally in the cerrados north and east of Santa Cruz, the plains on either side of the Rio Beni and steep-sided seasonally burnt slopes in the Yungas of La Paz. Flowers intensively after burning and the onset of the spring rains from September to November and sporadically at other seasons.

Specimens examined: BENI: Ballivián, *Beck 20020* (LPB, US), *Wasshausen & Wood 2183* (K, LPB, US); Espíritu, *Beck 5178* (LPB, US); Marbán, *Beck 2696* (LPB, US). LA PAZ: *Bang 2472* (BM, G, MO, NY, US); Caranavi, Coroico, *Buchtien 3910* (US); Milluguaya, *Buchtien 4429* (US); Iturralde, *Haase 606* (LPB, US), *Wasshausen & Wood 2182* (CAS, GOET, K, LPB, US), *2182A* (US); Nor Yungas, *Beck 12949* (LPB, US). SANTA CRUZ: Ñuflo de Chávez, *Beck 12298* (LPB, US), *Wood & Mamani 13990* (K, LPB, US), *Wood 15093* (K, LPB, US); Chiquitos, *D'Orbigny s.n.* (BR); *Bourke-Borrowes s.n.* (K); *Wood 17284* (K, LPB, US), *Wood & Guzman 17422* (K, LPB, US); Velasco, *Kuntze s.n.* (NY, US), *Krapovickas 32283* (CTES, US), *Jardim 149* (MO, USZ), *Killeen 5940* (MO, US, USZ), *Saldias 2849* (MO, US, USZ), *Wasshausen & Wood 2261* (CAS, K, LPB, US); Sara, *Wood 12175* (K, LPB, US), *Wood & Goyder 15751* (K, LPB, US); *J. Steinbach 6498, 6670* (BM, K), *F. Brooke 68* (K), *Brooke 5789* (BM); without exact locality, Cochabamba - SANTA CRUZ: *Badcock 402* (K). CHUQUISACA: Tomina, Rosal, *Brooke 5754* (BM); Siles, *Muhlbauer s.n.* (US); Calvo, *Wood 14206* (LPB, K).

Ruellia glischrocalyx Lindau, Bull. Herb. Boiss., ser. II, 4:321. 1904. TYPE: Peru, Loreto, Pampas de Ponasa, *Ule 6817* (holotype B, destroyed; lectotype, here chosen, HBG).

Ruellia quadrifaria (Nees) Lindau, in Engl. & Prantl, Nat. Pfanzenfam. 4, Abt. 3b:311. 1895., non *Ruellia quadrifaria* Wall. 1832. - *Stephanophysum quadrifarium* Nees, in DC., Prodr. 11:202. 1847. TYPE: Peru, *Ruiz s.n.* (holotype B, destroyed; F photo 18216).

Shrubby; stems glabrous; leaf blades oblong, glabrous, apically long and obliquely acuminate; inflorescence terminal, forming a capitulum composed of a short panicle; bracts and bracteoles obscuring base of capitulum, glandular-puberulous; pedicels equaling calyx lobes, these equal, oblong, glandular pubescent; corolla white, tube 60 mm long, cylindric to middle, apically enlarged, densely puberulous, lobes rotundate.

A rare plant of the Amazon basin in Ecuador, Peru, Bolivia and Brazil.

Specimens examined: PANDO: Román, Río Negro, *Solomon 17106* (MO).

Ruellia gracilis Rusby, Mem. Torrey Bot. Club 6:102. 1892. TYPE: Bolivia, La Paz, Laracaja, between Guanay & Tipuani, *Bang 1449* (holotype NY; isotypes BM, K, MO, US-1954077).

Herbaceous, minutely strigose; stems erect, slender, nearly unbranched, 20-30 cm; leaves sessile, blades linear-oblong, 30-50 x 3-7 mm, bright green, margin entire; flowering branchlets 4 or 5 cm long, very slender, erect, one-flowered or bearing several sessile flowers near summit; calyx lobes subequal, linear-setaceous; corolla scarlet, 20 mm long, narrow basal portion 5 mm

long, dilated abruptly into a body which is 4 times as wide, strongly ventricose, lobes short and broad, erect-spreading; capsule lance-oblong, acute, green, 10 mm long.

A rare and little-understood endemic species closely related to *Ruellia brevifolia*, apparently growing on rocks beside rivers in the Yungas.

Specimens examined: La Paz: Tamayo, *Daly 6633* (NY, US); Isopuri, *Williams 751* (K, NY, US).

Ruellia haenkeana (Nees) Wassh., Beitr. Biol. Pflanzen 63:423. 1988. - *Arrhostoxylum haenkeanaum* Nees, in DC., Prodr. 11:211. 1847. Type: Peru, *Haenke s.n.* (lectotype PR, here chosen; isolectotype GZU).

Ruellia euantha Lindau, Bull. Herb. Boiss., ser. I, 3:366. 1895. Type: Bolivia, *Kuntze s.n.* (holotype B, destroyed; F photo 18208; isotype NY).

Stemonacanthus pearcei Hook. f., Bot. Mag. 93:tab. 5648. 1867. - Type: based on fig. in tab. 5648 of Bot. Mag. 93. 1867.

Climbing shrub 1-3 m; stem moderately thick, quadrangular, smooth and glabrous; leaves short-petiolate, blades elliptic to oblong, submembranaceous, glabrous or puberulous, margins entire; flowers borne in axillary dichotomously branched cymes, peduncles exceeding leaf blades, secondary peduncles 1-2.5 cm long; calyx lobes linear-subulate, 10-13 mm long; corolla crimson, 50-70 mm long, obconic-elongate, glabrous, lower half of tube curved, limb 20-23 mm wide, lobes oblong, 8 x 4.5-5.5 mm; capsule clavate, glabrous, 8-seeded. Variable in flower color and habit pubescence.

A locally frequent species of moist, primary, Andean forest at elevations between 660 and 1700 meters from Peru south to the Chaparé region. Flowers during the winter dry season from May to September.

Specimens examined: Beni: Yucumo, *Fournet 464* (US); Alto Beni, Chapari, *Badcock 160, 215* (K). La Paz: Tamayo, *Beck 18487* (LPB, US), *Kessler 3761A* (LPB, US), *Gentry 70930* (MO, US); Saavedra, *Wasshausen & Wood 2269* (K, LPB, US); Yungas, *Rusby 1124* (NY, US); Sud Yungas, *Luteyn 13693* (NY, US), *Seidel 4087* (LPB, US), *Smith 13087* (LPB, MO, US), *Wasshausen & Wood 2197* (CAS, K, LPB, NY, US), *Wood 9959* (K, LPB, US); Alto Beni, *Badcock 160, 215* (K); Nor Yungas, *D'Arcy 13861, 13894A* (MO, US), *Beck 9242* (LPB, US), *Solomon 9516* (MO, US), *13984* (MO, NY, US), *18373* (LPB, MO, NY, US), *18461* (MO), *Wasshausen et al. 2099* (CAS, K, LPB, US), *Wasshausen & Wood 2145* (K, LPB, US), 10 km below Unduavi, *Brooke 6616* (BM); Murillo, *Beck 1225, 3580* (LPB, US), *Solomon 7536, 10773* (MO, NY, US), *17228* (MO, US), *19054* (MO), *Wood 8595* (K, LPB, US); Larecaja, Mapiri Region, *Buchtien 1376, 1377, 1378, 1380, 1382* (US), *1383* (NY, US), *1385, 1389, 1390, 1408* (US), *1493* (NY, US), *1495, 1503* (US); Guanay, *Rusby 1120* (NY, US); Mapiri, *Rusby 1122* (NY, US); Caranavi Coroico, *D'Arcy 13861, 13894A* (MO, US); Sorata, *Mandon 300 bis* (BM, K). Cochabamba: Chapare, *Wasshausen et al. 2070* (CAS, GOET, CORD, K, LPB, NY, US), *Wood 8536, 12379* (K, LPB, US); Espíritu Santo, *Buchtien 2254* (NY, US), *Herzog 2263* (L), Villa Tunari, *Beck 1466* (LPB, US); sin loc. ex Cochabamba, *Buchtien 2254, 2308* (US), vic. Cochabamba, *Bang 1199* (BM, K, MO, NY, US), *2055* (NY, US). Without precise locality: Bolivia, *Pearce 757* (K).

Ruellia haenkeana (Nees) Wassh. var. **haenkeana** fo. **lutea** Wassh. & J. R. I. Wood, Proc. Biol. Soc. Wash. 116:264. 2003. Type: Bolivia, La Paz, Murillo, Valle de Zongo, 1300 m, 14 Jun 1980, *Beck 3681* (holotype US-2948249; isotype LPB). Fig. 30 (A-D).

Distinguished from typical *R. haenkeana* by its yellow flowers and distinctly glabrous leaf blades. Apparently restricted to the Zonga Valley.

Specimens examined: La Paz, Murillo, Valle de Zongo, 1400-1600 m, 22 Apr 1982, *Solomon 7535* (MO, US).

Ruellia haenkeana (Nees) Wassh. var. **haenkeana** fo. **purpurea** Wassh. & J. R. I. Wood, Proc. Biol. Soc. Wash. 116:266. 2003. Type: Bolivia, La Paz, Caranavi, by road ascending serrania E of Caranavi towards Bolinda, 1200 m, 27 Jul 1998, *Wood & Wasshausen 13768* (holotype US-3404228; isotypes K, LPB). Fig. 30 (E-G).

Distinguished from typical *haenkeana* by its purple flowers and distinctly puberulous leaf blades. Distributed on the mountains north and east of Caranavi.

Specimens examined: La Paz: Caranavi, *Beck 9242* (LPB, US), *Rea & Rea 10* (LPB, US), *Solomon*

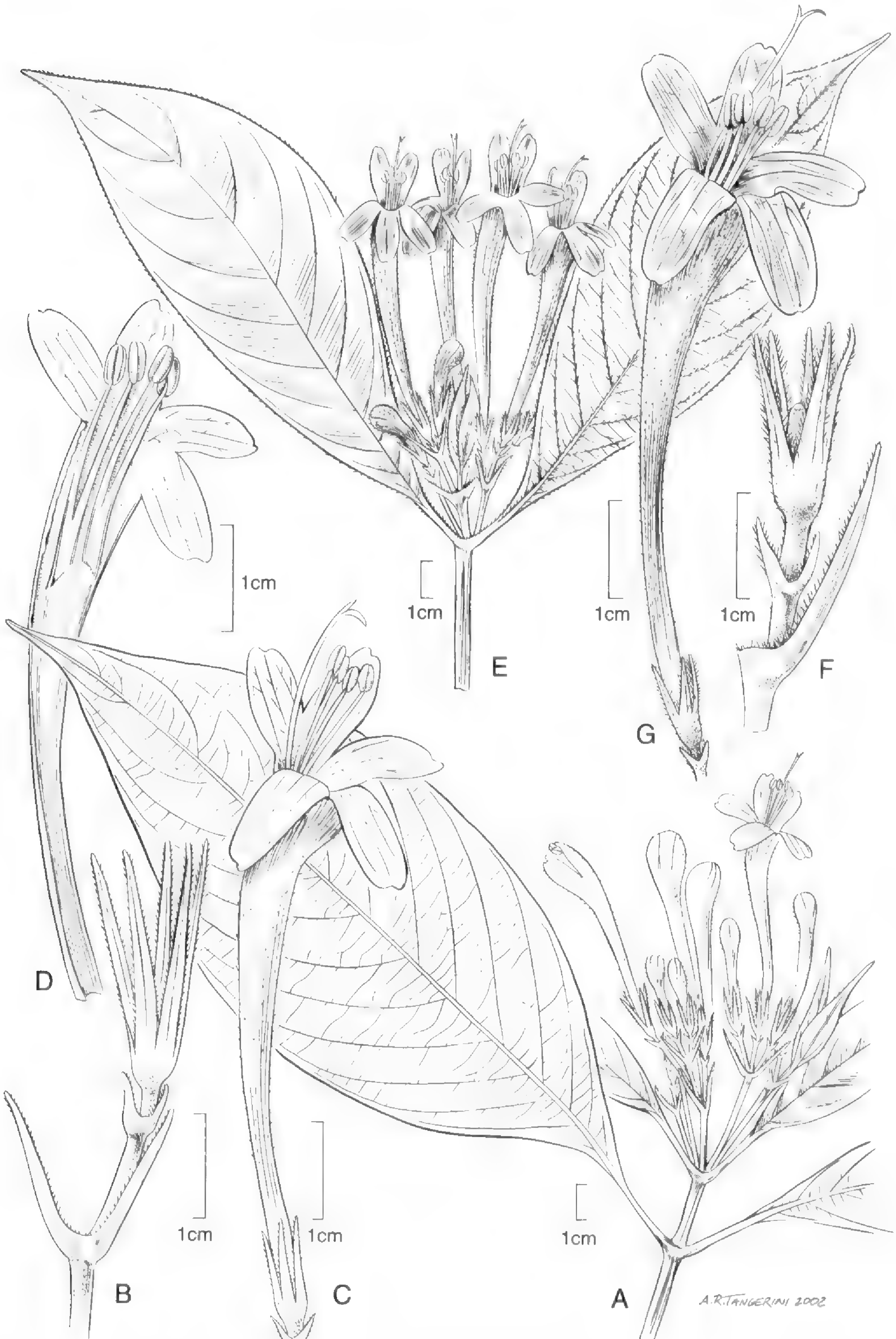


Fig. 30. *Ruellia haenkeana* var. *haenkeana* fo. *lutea*. A. Habit. B. Bract, bracteoles and calyx lobes. C. Bracteoles, calyx lobes, corolla, stamens, style and stigma. D. Corolla expanded. E-G. *Ruellia haenkeana* var. *haenkeana* fo. *purpurea*. E. Habit. F. Bract, bracteoles and calyx lobes. G. Bracteoles, calyx lobes, corolla, stamens, style and stigma. (A-D, from *S. Beck 3681*, US; E-G, *D. Wasshausen & Wood 2144*, US).

13984 (MO, US), *Wasshausen et al. 2104* (CAS, GOET, K, LPB, US), *Wasshausen & Wood 2144* (LPB, US).

Ruellia haenkeana (Nees) Wassh. var. **pilosa** Wassh. & J. R. I. Wood, Proc. Biol. Soc. Wash. 116:263. 2003. TYPE: Bolivia, La Paz, Sud Yungas Río Bopi, San Bartolomé (near Calisaya), 750-900 m, 1-22 Jul 1939, *B. A. Krukoff 10502* (holotype US-1831858, 1778166; isotypes K, NY). Fig. 31.

Separated from var. *haenkeana* by its pink or rose colored flowers and distinctly pilose leaf blades. Distributed in scattered localities in the Yungas of La Paz.

Specimens examined: LA PAZ: Sud Yungas, *Beck 1756* (LPB, US); Larecaja, *Buchtien 1372*, *1373*, *1378* (US); Caranavi, *Wasshausen et al. 2109* (LPB, US), *2111* (CAS, LPB, US).

Ruellia hygrophila Mart., Flora 24, Beibl. 2(5):65. 1841.

Lychniothyrus hygrophilus (Mart.) Bremek., Bull. Torrey Bot. Club 75:669. 1948. TYPE: Brazil, without locality, 1839, *Martius 580* (holotype BR; isotype NY).

Ruellia chiquitensis Baill., Bull. Mens. Soc. Linn. Paris 2:853. 1890. TYPE: Bolivia, Santa Cruz, Chiquitos, *Weddell 3495* (holotype P).

Low perennial acaulescent herb; leaves clustered in a rosette, shortly petiolate, blades obovate, glabrous, margin entire; flowers borne on lax, multiflowered anisocaulous, elongate dichasia, appearing somewhat racemiform; calyx lobes linear, short-pilose and ciliate; corolla pale blue, 30-50 mm long, basal tube 10-15 mm long, obconic throat 12-15 mm long, lobes reflexed, suborbicular; capsule narrowly elliptic.

Scattered in southeastern Bolivia, southwestern Brazil, Paraguay, northeastern Argentina and northwestern Uruguay growing in open, seasonally moist grassland on hard clay soils around the chaco. Flowers after the first spring rains, principally from September to December

Specimens examined: BENI: Cercado, Trinidad, *Werdermann 2401* (K, MO); *Cárdenas 3977* (BOLV, US). SANTA CRUZ: German Busch, Puerto Suares, *Hatschbach 52518* (MBM, US), *Wood & Guzman 17382* (K, LPB, US); Chiquitos, *Weddell 3495* (P), *Wood & Goyder 15725* (K, LPB, US); Cordillera, Cabezas, *Peredo s.n.* (LIL, US); Río Parapetí, *Gentry 75298* (MO, US), *Tutin 1519* (BM). TARIJA: Gran Chaco, *Wood & Goyder 16835* (K, LPB).

Ruellia inflata Rich., Actes Soc. Hist. Nat., Paris 1:110. 1792. - *Arrhostoxylum inflatum* (Rich.) Nees, in DC., Prodr. 11:215. 1847. TYPE: French Guiana, *Leblond 272* (holotype G-DC).

Stephanophysum cordifolium Mart. ex Nees, in Mart., Fl. Bras. 9(7):51. 1847. TYPE: Brazil, Pará, *Martius s.n.* (holotype M; F photo 20521).

Decumbent to ascending scrambling perennial; stem terete or quadrangular, glabrous; leaves petiolate, blades elliptic-oblong, minutely puberulous, basally unequally cordate, margin entire or subrepand; inflorescence axillary, pedunculate, flowering branches arching downward, peduncles equaling or slightly exceeding leaves, flowers often bifid and few, pedicellate; bracteoles inconspicuous, oblong; calyx lobes narrowly linear, green, scabrous-pubescent; corolla curved, red, 5O mm long, puberulous, tube cylindrical, opening into a posteriorly inflated, ventricose throat, narrowed toward orifice, limb divided, lobes spreading, ovate-triangular; capsule clavate, puberulous; seeds 8-12.

Widely distributed through the Amazon region from French Guyana to Amazonian Bolivia with an isolated colony in the Chapare region. It is a lowland plant of disturbed rain forest flowering during the winter dry season.

Specimens examined: PANDO: Román, *Solomon 17111* (LPB, MO, US); Abuná, *L. Vargas 629* (LPB, US), *932* (LPB), *Gentry 77770* (MO, US), *77992* (MO); Suárez, *Sperling 6470* (LPB, MO, NY, US); Madre de Dios, *Killeen 3959* (LPB, MO, US); Manuripi, *Sperling 6586* (LPB, NY, US), *Jardim 2356* (US, USZ). LA PAZ: Iturralde, *Beck 18270* (LPB, US). COCHABAMBA: Carrasco, *Wasshausen 2063* (LPB, US), *Brummitt et al. 19341* (LPB, K, US), *Wood 14888*, *15008* (K, LPB, US). SANTA CRUZ: Ichilo, *Wood 12208* (K, LPB, US).

Ruellia longipedunculata Lindau, Bull. Herb. Boiss., ser. I, 3:365. 1895. - TYPE: Bolivia, Santa Cruz, *Kuntze s.n.* (holotype B,

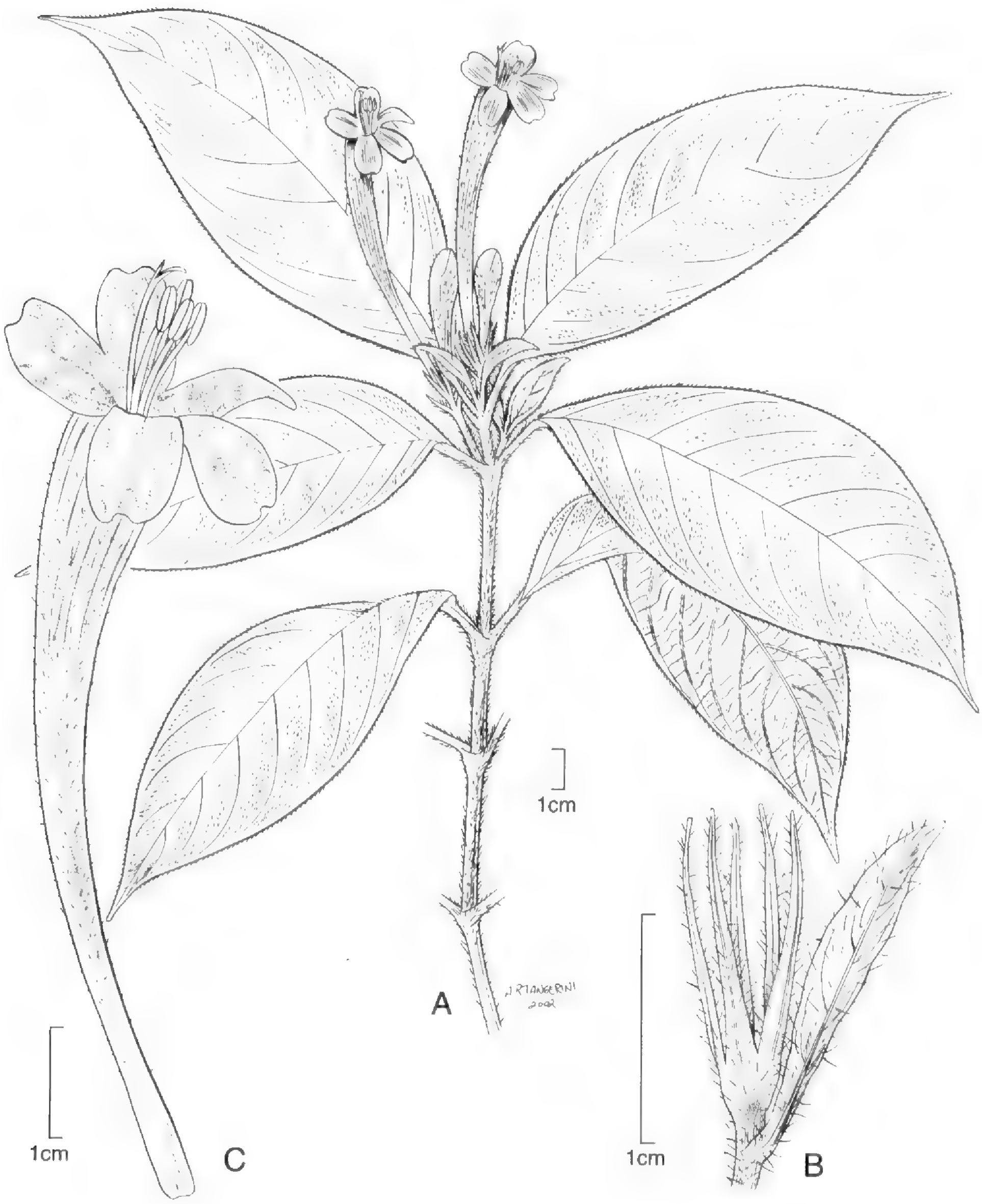


Fig. 31. *Ruellia haenkeana* var. *pilosa*. A. Habit. B. Bracteole and calyx lobes. C. Corolla, stamens and stigma. (From *B. Krukoff 10502*, US).

destroyed; F photo 18213; isotypes NY, US-702107).

Stephanophysum brookeae Bremek., Proc. Konin. Nederl. Akad. Wetensch. s. C. 72, no. 4:424. 1969. TYPE: Bolivia, Santa Cruz, Camiri, on Río Parapetí refinery, *Brooke 5577* (holotype BM; isotype NY).

Stout suffruticose herb to 2 m; stem ascending, obtusely quadrangular; leaves petiolate, blades ovate, glabrous, margin shallowly crenate or dentate; flowers pedicellate in dichasia forming lax, long-pedunculate cymes, exceeding subtending leaves; bracteoles spathulate to oblanceolate; calyx lobes oblong-lanceolate, 12-15 mm long; corolla red, 25-30 mm long, basal tube ca. 13 mm long, opening into a subcylindrical throat, lobes semierect, rounded, 3-4 mm long; capsule clavate, glabrous; seeds 6-8.

A characteristic species of the Tucuman-Bolivian forest belt extending along the Andean foothills from northern Argentina to the Santa Cruz region but only ascending to about 1000 m. It is found in open forest and disturbed bushy ground often on sandstone and flowers through the winter dry season from about June to September. It has a very similar distribution to species like *Justicia kuntzei* subsp. *kuntzei* and *J. oranensis*.

Specimens examined: SANTA CRUZ: Ichilo, *Solomon 14136* (MO, US), *Lewis 37758* (LPB, MO, US); Ibáñez, *Nee 33798* (NY, US); *Wood 13750* (K, LPB, US); Florida, *Acevedo 4520* (US), *Fosberg 28615* (US), *Kessler et al. 12306* (LPB, US); Cuesta de los Monos, *Herzog 1744* (L); *Vallegrande*, Quirusillas, *Cárdenas 5096* (BOLV, US), *Kessler et al. 5333, 5345* (US); Angostura, *R. Steinbach 306* (MO). CHUQUISACA: Calvo, Monteagudo, *Beck 9832* (LPB, US), *Muhlbauer s.n.* (US), *Wood 9694* (K, LPB, US); Siles, *Kessler 4858, 5041* (LPB, US). TARIJA: Gran Chaco, Villamontes, *Pflanz 4132* (US); Arce, Bermejo, *Beck 9555* (LPB, US); Emboroza-Sidras road, *Solomon 10157* (MO, US).

Ruellia macrosolen Lillo ex C. Ezcurra, Syst. Bot. 14(3): 297. 1989. TYPE: Argentina, Jujuy, San Pedro de Jujuy, *Schreiter 5211* (holotype LIL; isotypes BA, LP, US-1877156).

Low perennial herb 20-40 cm; stem ascending, sparsely branched, subtetragonous, pilose and glandular-pubescent, glabrescent at maturity; leaves petiolate, blades thin, ovate or elliptic; pilose on midveins; inflorescence terminal and axillary, lax, pedunculate, few-flowered dichotomous cymes, aggregated in thyrses and often appearing paniculate; bracteoles linear and small; calyx lobes linear, glandular-pubescent; corolla erect, white, regular, basal tube 25-30 mm, throat 15-30 mm, tinted with grayish-mauve at base, lobes rounded, ca. 15 x 15 mm, often emarginate; cleistogamous flowers frequent, reduced; capsule elliptical, puberulent; seeds 12-22. This species is recognized by its white, nocturnal, sphingophilous flowers with a long basal tube. It is closely related to the bee-pollinated, diurnal, blue-flowered *Ruellia ciliatiflora* and can be sympatric with it. These species are probably genetically isolated because of differing pollen vectors (Ezcurra, 1989).

A plant of scattered occurrence along the western and northern Chaco fringes in southeastern Bolivia, western Paraguay and northern Argentina. It grows on open grassy plain, often on sandy soils and flowers during the rains from November to March.

Specimens examined: SANTA CRUZ: Chiquitos, *Wood & Wendelberger 17222* (K, LPB, US); Cordillera, *D'Orbigny 3604* (P), *Michel 93, 568* (LPB, US); Cabezas, *Peredo s.n.* (LIL, US), *Wood & Goyder 16850* (K, LPB, US). TARIJA: Gran Chaco, *J. Steinbach 1779* (LIL, US), *Wood 16078* (K, LPB, US); Villamontes, *Herzog 1140* (L).

Ruellia menthoides (Nees) Hiern, in Warm., Symbolae 1877:72. 1878. - *Dipteracanthus menthoides* Nees, in Mart., Fl. Bras. 9(7):44. 1847. TYPE: Brazil, Amazonas, prov. Rio Negro, *Martius s.n.* (syntype M; F photo 20429).

Herbs 1 m; stem distinctly quadrangular; leaf blades ovate-oblong; flowers axillary, sessile, verticillate and clustered; bracts subtending fascicles linear, conspicuous, 10-11 x 0.5-0.7 mm; corolla white with violet veins, narrowly funnelform, ca. 15 mm long, tube slightly oblique; capsule clavate.

An uncommon but widespread species of the Amazon region of Venezuela, Bolivia and Brazil.

Specimens examined: BENI: Iténez, *Quevedo et al. 998* (MO, US, USZ).

Ruellia nitida (Nees) Wassh. & J. R. I. Wood, Proc. Biol. Soc. Wash. 116:269. 2003. - *Arrhostoxylon nitidum* Nees, in Mart., Fl. Bras. 9(7):59. 1847. TYPE: Brazil, Amazonas, Borba, *Riedel s.n.* (holotype LE; isotype GZU).

Herbs 0.3-1 m; stems quadrangular; leaf blades oblong-lanceolate, nitid, apically long-attenuate; inflorescence terminal and axillary, trichotomous panicles borne on long, glabrous peduncles, these exceeding upper leaf blades; calyx glandular-pubescent; corollas mauve, pink or rose colored, 25-30 mm long, tube curved inwards, expanded portion equal to tube in length; capsule clavate.

Locally frequent in seasonally moist forest in northeastern Bolivia and the Amazonian states of Rondonia, Amazonas and Mato Grosso in Brazil. Flowering in the winter dry season from July to October.

Specimens examined: PANDO: Román, Abuná, *Prance 6201* (K, MO, NY, US); Riberão, *Prance 6471* (K, NY, US); Madre de Dios, *Moraes 242* (LPB, US); Manuripi, *Gonzales 38* (LPB, US). BENI: Vaca Díez, *Solomon 6189* (MO, US), *7774* (MO, US); *Bergeron 317* (LPB, US). SANTA CRUZ: Velasco, *Arroyo 1354* (US, USZ), *Foster et al. 655* (US, USZ), *Guillen & Chore 1661* (US, USZ), *Guillen et al. 4581* (US, USZ), *Jardim & Foster 3041* (US, USZ), *Ritter et al. 3629* (NHA, US), *Wasshausen & Wood 2235* (CAS, GOET, K, LPB, US), *2254* (K, LPB, US), *2255* (CAS, GOET, K, LPB, US); Ñuflo de Chávez, Ascención de Guarayos, *Beck 12277* (LPB, US); Preserverancia, *Wood 10009* (K, US), *I. Vargas 592* (US).

Ruellia nobilis (S. Moore) Lindau, Repert. Spec. Nov. Regni Veg. 7:67. 1909. - *Salpigacanthus nobilis* S. Moore, J. Bot. 42:107. 1904. SYNTYPES: Brazil, Mato Grosso do Sul, Corumbá, *Robert 713a, 800* (syntypes BM; isosyntypes NY).

Ruellia herzogii Lindau, Repert. Spec. Nov. Regni Veg. 7:67. 1909. TYPE: Bolivia, Santa Cruz, Velasco, Yotau, *Herzog 370* (holotype L).

Small shrub; stem sparsely branched, terete, glabrous, pale at maturity; leaves petiolate, blades broadly ovate, lightly velutine-puberulous, margin entire; flowers subsessile, solitary in axils of upper leaves; bracteoles obsolete; calyx 20-30 mm long, unequally cleft, puberulous; corolla white, ca. 100 mm long, basal tube 70-90 mm long, throat obconic, 10-20 mm long, lobes white, spreading, suborbicular; capsule oblong-elliptic, glabrous; seeds 6-8. A night-flowering, moth-pollinated species with a long pale, corolla tube.

An apparently rare but possibly overlooked species of dry forest in southeastern Bolivia and adjacent parts of Paraguay and Brazil along the northern fringes of the chaco. Flowers in September-October at the end of the dry season but for only a week or two.

Specimens examined: SANTA CRUZ: Ñuflo de Chávez, *Fuentes 1346* (MO); Chiquitos, *Vargas 3343* (US, USZ), *Wood 17327, 17894* (K, LPB, US).

Ruellia pearcei Rusby, Bull. New York Bot. Gard. 4:429. 1907. TYPE: Bolivia, Cochabamba, *Bang 2056* (lectotype NY, Wasshausen & Wood 2003b:266; isolectotype US-944054). Fig. 29 (A-D).

Erect perennial herb, 50-150 cm high; stems slender, rigid, erect-branched, quadrangular, striate, minutely greyish-puberulent; leaves petiolate, blades lanceolate, 7-15 x 2-5 cm, apically long-acuminate and acute, basally acuminate and gradually narrowed into petiole; inflorescence axillary, lax, long-pedunculate, multiflowered cymes of compound dichasia; bracteoles linear-lanceolate, exceeding calyx lobes; calyx linear-attenuate, 7-10 mm long, 1-nerved, puberulous; corolla bright red to orange-red, thin, 35-45 mm long, tube slightly curved, infundibular, slightly ventricose above, lobes 5-7 x 4-7 mm, emarginate; capsule strongly clavate, 15-20 mm long, glabrous. This species is one of several which are closely related to *R. breviflora* but is usually easily distinguished by the leaf shape and the larger, distinct-shaped flowers.

Locally frequent in moist rain forest along the Andean foothills from the Masicuri region east of Vallegrande north to southern Peru from 600 to 1200 m. It flowers throughout the winter dry season from April to October.

Specimens examined: BENI: Ballivián, *Rivero 364* (US), *Balderrano 483* (US), *Kessler et al. 10888* (LPB, US), *Beck 1691* (LPB, US), *Smith et al. 13200* (K, LPB, US). LA PAZ: Iturralde, *Kessler 11204* (LPB, US); Tamayo, *Kessler 3803, 3836* (LPB, US); Larecaja, *Kessler et al. 4402* (LPB,US); Sud Yungas, *Kessler et*

al. 5793 (LPB, US), *Wood & Wasshausen 13783* (K, LPB); Caranavi, *Wasshausen 2103, 2139* (CAS, GOET, LPB, US); Nor Yungas, *Wood & Mondaca 14530* (K, LPB). COCHABAMBA: Chapare, Espírito Santo, *Buchtien 2239, 2309* (US), *Wood 8537* (K, LPB, US), *10081* (K, US); *Bang 1223* (NY, US); Tiraque, *Wood 13673* (K, LPB). SANTA CRUZ: Ichilo, *Brummitt 19320* (K, LPB, US), *Wasshausen 2060* (CAS, GOET, K, LPB, US), *Wood 1212* (K, LPB) *9843* (K, LPB,US), *11150* (LPB), *12212* (K, US); Florida, *Wood, Mendoza & Vidal 19667* (LPB, K); Vallegrande, *Kessler et al. 6104* (LPB, US). WITHOUT PRECISE LOCALITY: Río San Juan, *Williams 258* (K, NY,US).

Ruellia proxima Lindau, Bull. Herb. Boiss., ser. I, 3:365. 1895. TYPE: Bolivia, Cochabamba, Río Juntas, *Kuntze s.n.* (holotype B, destroyed; F photo 18408; isotype US-702108).

Ruellia thyrsostachya Lindau, Bull. Herb. Boiss., ser. II, 4:320. 1904. TYPE: Peru, Puno, Sandia, Chunchusmayo, *Weberbauer 1173* (holotype B, destroyed; F photo 18220).

Shrub, 2 m; stem quadrangular, glabrous; leaves petiolate, blades thick, oblong, 26 x 11 cm, glabrous, margin subentire; inflorescence spicate, terminal, simple, long-pedunculate; lower bracts marginate, basally subulate, upper diminished in length, pilose; bracteoles similar; calyx lobes 9-13 mm long, pilose; corolla whitish (red, fide Lindau), tube 53 mm long, becoming obliquely ventricose, apically 15 mm in diam., pilose; capsule stipitate, glabrous; seeds 8-12, white-margined.

Locally frequent in partial shade in lowland rain forest along the foothills of the Andes from the Amboró Park north to southern Peru and also occurring in Amazonian Bolivia and Brazil. It flowers during the winter dry season from May to September.

Specimens examined: PANDO: Román, Abuná, *Prance 6202* (NY, US). BENI: Ballivián, San Borja, *Beck 1688, 6867A* (LPB, US), carretera Yucumo - Rurrenabaque, *Killeen 2906* (LPB, MO, US), *Smith 13248* (LPB, MO), *13548* (LPB, MO, US), *Solomon 14631* (MO). LA PAZ: Iturralde, *Wood & Wasshausen 13802* (K, LPB); *Helme 853* (LPB, US); *Wasshausen & Wood 2165* (CAS, K, LPB, US); Caranvi, *Wasshuasen & Wood 2151* (CAS, K, LPB, US). COCHABAMBA: without precise locality, *Bang 1295* (NY, US); Chapare, Espíritu Santo, *Buchtien 2235* (US), Cueva de los Guácharos, *Kessler 350* (GOET, US); Incachaca-S. Antonio, *Werdermann 2130* (MO), *Wasshausen et al. 2076* (GOET, K, LPB, US); Tiraque, *Wood 8520, 8531* (K, LPB). SANTA CRUZ: Ichilo, *Wood 12211* (K, LPB). WITHOUT PRECISE LOCALITY: Buturo, Jul 1865, *Pearce s.n.* (BM).

Ruellia puri (Nees) Mart. ex Jackson, Index Kew. 1:775. 1893. - *Dipteracanthus puri* Nees, in Mart., Fl. Bras. 9(7):35. 1847. SYNTYPES: Brazil, Minas Gerais, President S. Joannis Baptista, *Martius s.n.* (syntype BR); Minas Gerais, Serra de S. Geraldo, *Martius s.n.* (syntype BR).

Tocoanthus pearcei Baill., Bull. Mens. Soc. Linn. Paris, 2:832. 1890. TYPE: Bolivia, Santa Cruz, *Pearce s.n.* (holotype K).

Ruellia puri (Nees) Mart. ex Jackson var. *longipetiolata* S. Moore, Trans. Linn. Soc. II. Bot. 4:425. 1895. TYPE: Brazil, Mato Grosso, Serra da Chapada, *S. Moore 174* (holotype BM).

Ruellia bangii Rusby, Mem. Torrey Bot. Club 6:102. 1896. TYPE: Bolivia, La Paz, Larecaja, between Guanay & Tipuani, *Bang 1355* (holotype NY; isotypes K, MO, US).

Ruellia lechleri Britton ex Rusby, Bull. Torrey Bot. Club 27:75. 1900. TYPE: Bolivia, La Paz, Larecaja, Mapiri, *Rusby 1165* (holotype NY; isotypes BM, US-944040).

Ruellia lechleri Britton ex Rusby var. *grandifolia* Britton ex Rusby, Bull. Torrey Bot. Club 27:75. 1900. TYPE: Bolivia, La Paz, Yungas, *Rusby 1116* (holotype NY; isotype US-206921).

Suffruticose herb or subshrub to 1.5 m; stem erect, quadrangular, dark brown or blackish; leaves petiolate, blades ovate, dark green, thin, venation prominent on both surfaces; flowers sessile and concealed at base among crowded, densely appressed terminal leaves; bracts foliaceous; calyx lobes linear-attenuate, rigid; corolla lavender, violet, lilac, tinged with white or pink, tube consisting of a strongly curved, cylindrical lower portion 35 mm long, and an upper, infundibular, sigmoid curved portion ca. 10 mm long, lobes 20 mm long; capsule clavate, puberulous; seeds ca. 12.

Locally abundant along streams and in moist, often disturbed places in rain forest along the

Andean foothills from the Santa Cruz area northwards into Peru and Ecuador. Also widespread in central Brazil extending into Bolivia in the Noel Kempf Mercado National Park but otherwise absent from Amazonian Bolivia. Flowers in the winter dry season from May to October.

Specimens examined: BENI: Ballivián, *Daly 6604* (NY, US). LA PAZ: Sud Yungas, *Buchtien 529, 530* (US), *Krukoff 10237, 10238* (MO, NY, US), *Beck 362* (LPB, US), *1664* (LPB, NY, US), *12084* (LPB, US), *Seidel 1022, 2731* (LPB, US), *Solomon 14283, 14286* (MO, US), *Schmit 63* (LPB, US); Chulumani, *D'Orbigny 470 p.p.* (P), *Brooke 6519* (BM), *Badcock 97* (K); Nor Yungas, *Buchtien 4715, 5786* (US), *Beck 8346* (LPB, NY, US), *9186* (LPB, US), *Seidel 1098, 1099* (LPB, US), *Solomon 4840* (MO), *8790, 11573, 12039, 13990* (MO, US), *12211* (MO, NY, US), *18427* (LPB, MO, US), *Schmit 35* (LPB, US), *Wasshausen 2130* (LPB, US); Larecaja, Mapiri, *Buchtien 1970* (US), *Rusby 1165* (NY, US); Tipuani, *Buchtien 5570* (US); Guanay-Tipuani, *Bang 1355* (NY, US); Tamayo, *Kessler 3814* (LPB, US); Muñecas, *Kessler 4454* (LPB, US); Inquisivi, *Lewis 88862* (LPB, MO, US); Canamina, *Rusby 56* (NY, US). COCHABAMBA: Chapare, *Wasshausen 2073, 2074, 2075* (LPB, US), Espíritu Santo, *Buchtien 2305* (US); Chapare/Tiraque, *Wood 13651* (K, LPB), *13652* (K, LPB, US), Espíritu Santo, *Buchtien 2305* (US). SANTA CRUZ: Velasco, *Sánchez 361* (MO, US), *Wasshausen & Wood 2252* (CAS, GOET, K, LPB, US); Ichilo, Parque Nacional Amboró, *Nee 41058* (NY, US), *Solomon 14080* (MO, US), *J. Steinbach 7414* (MO); Ibanez, *Wood 12447* (K, LPB, US).

Ruellia ruiziana (Nees) Lindau, in Engl. & Prantl, Nat. Pflanzenfam. 4(3b):311. 1895. - *Stephanophysum ruizianum* Nees, in DC., Prodr. 11:203. 1847. TYPE: Peru, Aluna, *Ruiz 4841* (syntype B, destroyed; F photo 18218; lectotype US-249756, here chosen).

Suffruticose herb or subshrub to 1.5 m; stem ascending, obscurely quadrangular with sharp angles, tomentose-pubescent; leaves petiolate, blades ovate, densely pubescent and viscous, margin entire or repand crenate; inflorescence axillary, dense, long-pedunculate, multiflowered cymes of compound dichasia; bracteoles linear, equaling or exceeding calyx lobes, tomentose; calyx densely puberulous; corolla crimson, ca. 30 mm long, tube curved inwards, narrow portion cylindric, 5-7 mm long, inflated, ventricose portion ca. 20 mm long, lobes ovate, small, obtuse, 2-3 mm long; capsule clavate, glabrous; seeds 4-12.

Found between 1000-2000 meters in Peru and northern Bolivia, most commonly in the Sud Yungas. Flowers in the winter dry season.

Specimens examined: LA PAZ: Sud Yungas, *Cárdenas 4357* (BOLV, US), *Beck 2952, 8593, 12139, 12608* (LPB, US), *Kessler 5718* (LPB, US); Inquisivi, *Kessler 5589, 5622* (LPB, US). COCHABAMBA: Ayopaya, *Kessler 9578* (LPB, US). SANTA CRUZ: Chiquitos, *D'Orbigny 668* (G); Florida, *Quevedo 7* (US).

Ruellia sanguinea Griseb., Abh. Königl. Ges. Wiss. Göttingen 24:260. 1879. TYPE: Argentina, Salta, Orán, *Lorentz & Hieronymus 269* (holotype GOET; isotypes B, destroyed, CORD).

Ruellia kuntzei Lindau, Bull. Herb. Boiss., ser. I, 3:365. 1895. - *Arrhostoxylom kuntzei* (Lindau) Bremek., Proc. Konin. Nederl. Akad. Wetensch. s. C, 72, no. 4:424. 1969. TYPE: Bolivia, without locality, *Kuntze s.n.* (holotype B, destroyed; F photo 18209; isotype NY).

Suffruticose subshrub to 1.5 m; stem ascending, quadrangular, terete and glabrescent at maturity; leaves petiolate, blades ovate, 6-16 x 4-8 cm, glabrous, margin smooth or irregularly and shallowly crenate; flowers subsessile or very shortly pedunculate, solitary in axils of reduced upper leaves; bracteoles narrowly oblanceolate or lanceolate; calyx lobes linear, 5-7 mm long; corolla red, 30-50 mm long, puberulous, tube thin and curved, 15-30 mm long, throat obconic, lobes semierect, rounded; capsule clavate, glabrous, seeds 8-10. Characterized by blood red flowers with long corolla tubes.

Locally frequent in moist forest up to 2000 m extending from northern Argentina along the Tucuman Bolivian forest belt north to the Santa Cruz area and with an isolated outpost in the Chapare region. Flowers during the winter dry season from about May to September.

Specimens examined: COCHABAMBA: Carrasco, *Kessler 7549* (LPB, US); Chapare, *Cárdenas 4585* (BOLV, US), road to Locatal, *Brooke 6766* (BM), *Ritter & Wood 3394* (NHA, US); below Locotal, *Wood 8497, 8561* (K, LPB, US). SANTA CRUZ: Florida, *Wood 9994* (K, LPB, US), *Balcazar & Robles 746* (US, USZ), *Kessler 12227* (LPB, US); Vallegrande, *Vargas 245*

(MO), *Wasshausen 2037* (K, LPB, US), *Wood 11115* (US), *Kessler 6091* (LPB, US). CHUQUISACA: Siles, *Kessler 4968*, *5073* (LPB, US), *Wood 8434* (K, US). TARIJA: Arce, *Krapovickas 18705* (US), *Solomon 9968*, *10037*, *10142*, *11083*, *11112* (MO, US), *11258* (MO).

Ruellia tweediana Griseb., Symb. Fl. Argent. 259. 1879. TYPE: Argentina, Entre Ríos, without locality, *Tweedie s.n.* (lectotype K, designated by Ezcurra 1993:812). *Cryphiacanthus angustifolius* Nees, in DC., Prodr. 11:199. 1847, non *Ruellia angustifolia* Sw., 1788. - *Ruellia spectabilis* Britton, Ann. New York Acad. Sci. 7:192. 1893, non Nicholson, 1886. - *Ruellia tweediana* Griseb. ex Fernald, Rhodora 47:13, pl. 840. 1945, *nom. superfl.*

Arrhostoxylon microphyllum Nees, in Mart., Fl. Bras. 9:61. 1847. - *Ruellia microphylla* (Nees) Lindau, Bot. Jahrb. Syst. 19, Beibl. 48:16. 1894, non Cavanilles, 1801. - *Ruellia ignorantiae* Herter, Rev. Sudamer. Bot. 4:193. 1937. TYPE: Uruguay, Montevideo, *Sellow s.n.* (holotype B, destroyed).

Ruellia coerulea Morong, Ann. New York Acad. Sci. 7:193. 1893. TYPE: Paraguay, Pilcomayo River, 1888-1890, *Morong 1013* (holotype NY; isotypes MO, US-944122).

Sparsely branched erect herb 30-120 cm from a basal rhizome; leaves shortly petiolate, blades ovate or elliptic to narrowly oblong or lanceolate, 5-12 x 0.3-1.5 cm, glabrous, margin entire; inflorescence of axillary, pedunculate, few-flowered cymes; bracteoles small, linear, glabrous; calyx of chasmogamous flowers 0.7-1.5 cm, lobes linear-lanceolate, glandular-puberulous; chasmogamous corollas tilted, blue or whitish, 30-40 mm long, tube 5-10 mm long, throat obconic, lobes suborbicular; capsule narrowly elliptic or oblong; seeds 16-24.

Locally abundant in open, wet or periodically flooded places adjacent to scrub in the chaco phytogeographic region of Bolivia, Paraguay, northeastern Argentina and limited areas of southeastern Brazil. Flowers principally at the beginning of the rainy season in September to November but sporadically at other times.

Specimens examined: BENI: Trinidad-Missiones Guarayos, *Werdermann 2400* (LPB, MO). SANTA CRUZ: Ñuflo de Chávez, *Fuentes 7341* (USZ), *Saldias et al. 1349* (US), *Wood 12512* (K, LPB, US), *Wood & Mamani 14005* (K, LPB, US); Chiquitos, *Navarro 2156* (USZ), *Wood & Mamani 13412*, *13498* (K, LPB, US); Cordillera, *Navarro & Vargas 309* (MO); *Bourdy 2115* (UCZ); *Ritter 3898* (NHA, US), *Wood & Goyder 16865* (K, LPB, US). CHUQUISACA: Calvo, *Saravia 13680* (LPB).

Ruellia yurimaguensis Lindau, Bull. Herb. Boiss., ser. II, 4:317. 19O4. TYPE: Peru, Loreto, Yurimaguas, *Ule 6282* (syntype B, destroyed; isosyntype HBG); Loreto, Maynas, *Poeppig 2394* (syntype B, destroyed).

Ruellia neoneesiana Wassh., Monogr. Syst. Bot. Missouri Bot. Gard. 45:1253. 1993. - *Dipteracanthus grandiflorus* Nees, in DC., Prodr. 11:134. 1847. - *Ruellia grandiflora* (Nees) Lindau, in Engl. & Prantl, Nat. Pflanzenfam. 4(3b):310. 1895, non *Ruellia grandiflora* Poir. 1890. TYPE: Peru, Huánuco, Pueblo Nuevo Lima, *Ruiz s.n.* (syntype B, destroyed; F photo 29187; isotype K).

Subshrub; stem obscurely quadrangular, pubescent, woody; leaves petiolate, blades ovate, 11 x 5-6 cm, thin, sparingly glandular above; inflorescence solitary, axillary at tip of stem forming a head of ca. 4 flowers subtended by leaflike bracts; bracteoles 0; calyx lobes lanceolate, 8-9 mm long, densely glandular; corolla lilac, tube subsigmoid, 45 mm long, cylindric, puberulous, lobes subequal, 12-14 mm in diam. This species has long, tubular, pale lilac flowers and is related to *R. puri*.

An uncommon plant of scattered localities in lowland rain forest in Peru and Bolivia, apparently most common in the Chaparé region. Flowers in the winter dry season from May to September.

Specimens examined: PANDO: Manuripi, *Cardiel & Prescott 81* (MO). BENI: Ballivián, *Guareco 101* (US). LA PAZ: Iturralde, *Serato 102* (US). COCHABAMBA: Chapare, *Kessler 8368* (LPB, US), *Wasshausen 2087* (LPB, US), *Wood 12367* (K, LPB, US); Chapare/Tiraque, *Wood 13681* (K, LPB, US); Carrasco, *Sigle 506* (LPB, US), *Smith 13712* (LPB, MO, US), *Wood 15005* (K, LPB, US); Chimoré, *Badcock 337* (K). SANTA CRUZ: Chavez, San Javier, *Cardenas 5240* (LIL, US), Santa Cruz-San Javier, *Ocampo 5240* (BOLV, US).

28. **Sanchezia** Ruiz & Pavón

Erect or climbing herbs or shrubs; stems usually glabrous; flowers solitary or more often fascicled, usually large and conspicuous, yellow, orange, red or purple, borne in heads, spikes or racemes, the flower clusters subtended by small or large, rarely partly connate bracts, these sometimes colored; calyx 5-lobed; corolla tube subcylindric, the limb 5-lobed, lobes equal; stamens 2, usually exserted; anthers normally bithecous, longitudinally ciliate, mucronulate at base; staminodes 2; capsule oblong, 6-8-seeded; seeds orbicular.

Key to the Species of **Sanchezia**

1a. Calyx included, not exceeding bracts ..... *S. oblonga*
1b. Calyx exceeding bracts 2

2a. Plants cultivated ornamentals; leaves with distinct yellow veins; bracts green with orange on tip; corolla ochre or light orange ..... *S. parvibracteata*
2b. Plants native; leaves not with distinct yellow-veins; bracts green, without orange at tip; corolla bright rose to rose-red ..... *S. putumayensis*

Sanchezia oblonga Ruiz & Pav., Fl. Peruv. Chil. 1:7, pl. 8, fig. b. 1798. TYPE: Peru, Huánuco, Cuchera, Pozuzo and Pillao near Chacahuassi, *Ruiz & Pavón s.n.* (holotype BM).

Sanchezia peruviana (Nees) Rusby, Mem. Torrey Bot. Club 6:103. 1896. - *Ancylogyne peruviana* Nees, in DC., Prod:. 11:222. 1847. *Mathews 2013* (lectotype K, here chosen).

Herb, 1.6 m; stem glabrous; petioles winged, connate; leaf blades oblong-lanceolate, apically acuminate, glabrous; inflorescence a terminal spike with a few, short, lateral branches; bracts red, ovate, pubescent; bracteoles red, linear, hirsute; calyx included, not exceeding bracts, lobes yellow, rounded apically; corolla yellow, 50 mm long, finely pubescent, lobes 4-5 x 2.5 mm, rounded; stamens exserted 12-15 mm beyond mouth of corolla; filaments pilose; staminodes white-pubescent basally; capsule oblong, 6-8 seeded. A shrub with conspicuous large red bracts and yellow flowers.

Although common in Peru this plant is only found in the very north of Bolivia growing in lowland rain forest.

Specimens examined: PANDO: Suárez, Cobija, *Beck 17138* (LPB, US). LA PAZ: Tamayo, *Wasshausen & Wood 2302* (LPB, US); Iturralde, *Bourdy 1542* (US); Larecaja, Mapiri, *Bang 1473* (BM, MO, NY, US); Río Satariapo, *Gentry 70818* (MO).

Sanchezia parvibracteata Sprague & Hutch., Kew Bull. 1908:253. 1908. TYPE: described from plant cultivated at Kew.

Illustration: Fig. 32; 1995. Acanthaceae. pp. 1-158 in Flora of Chiapas, Pt. 4, D. E. Breedlove, ed. California Academy of Sciences, San Francisco.

Suffrutescent herb or shrublet, 1.5 m; stem subquadrangular; leaf blades oblanceolate, green with yellow veins, glabrous, narrowed basally and decurrent on petiole, margin undulate and shallowly dentate; inflorescence an erect, sparingly branched, terminal panicle, fascicles usually several-flowered, sessile, subsecund; bracts subtending fascicles triangular-ovate, green with orange or yellowish towards tip; bract subtending flowers ovate, glabrous; calyx exceeding bracts, lobes oblanceolate; corolla ochre, 40-50 mm long, densely pubescent distally, lobes oblong, 6 x 4 mm, emarginate; stamens exserted 7-8 mm beyond mouth of corolla, the thecae pubescent; capsule oblong, 6-8-seeded.

An ornamental of unknown origin, frequently visited by humming birds, that is very commonly cultivated in gardens throughout the tropical lowlands of Bolivia.

Specimens examined: BENI: Ballivián, *Rivero 457* (US). SANTA CRUZ: Ibáñez, Santa Cruz, cult., *Nee 41089* (NY, US).

Sanchezia putumayensis Leonard, Contr. U.S. Natl. Herb. 31: 55, fig. 20. 1951. TYPE: Colombia, Putumayo, Río Putumayo, *Klug 1653* (holotype US-1691751; isotypes MO, NY).

Subshrub or treelet to 3 m; stems subquadrangular; leaf blades oblong-elliptic, 11-16 x 5.5-6.5 cm, glabrous, narrowed basally and decurrent on petiole, margin entire or undulate; inflorescence a panicle of 3 or 4 branches, fascicles small, few-flowered, secund; bracts small, ovate, 8 x 5 mm, glabrous; calyx exceeding bracts, lobes oblong or oblanceolate, 12 x 3.5-4.5 mm; corolla bright rose to rose-red, 40-45 mm long, hirtellous distally, lobes 4 mm in diam., rounded, emarginate; stamens exserted 15-20 mm beyond mouth of corolla; capsule oblong, 6-8-seeded.

Occasional along edge of lowland rain forest on terra firme in western Amazonia in Colombia, Ecuador, Peru and Bolivia.

Specimens examined: PANDO: Román, *Prance 6610* (K, NY, US); Suárez, *Beck 19228* (LPB, US).

29. **Schaueria** Nees

Schaueria azaleiflora Rusby, Mem. New York Bot. Gard. 7:365. 1927. TYPE: Bolivia, La Paz, Covendo, *White 990* (holotype NY).

Illustration: 1990. Ezcurra & Wasshausen, Darwiniana 30: 284.

Shrub or subshrub 0.8-1.5 m; stems cylindrical, slender, woody, striate, glabrous; leaves petiolate, blades elliptic, 6-12 x 2-3 cm, glabrous, very thin, grayish-green; inflorescence a short, terminal spike; flowers densely compacted; bracts minute, ovate, 2 mm long, margin entire; bracteoles small; calyx deeply 5-lobed, lobes subequal, lanceolate 3-5 mm long, glabrous; corolla cream-yellow to white to yellowish, 20-30 (50) mm long, tube infundibular, 10-15 mm long, bilabiate, lower lip strongly recurved, deeply 3-lobed, lobes subequal, narrowly oblong, 10-12 x 1.1.5 mm, apically obtuse, upper lip erect, narrow and concave, 10-12 x 3 mm, apically slightly bilobed; stamens 2, exserted; anthers 2-thecous, muticous; capsule obovate in outline, narrowly stipitate for about one-half its length, glabrous; seeds 4.

An apparently rare but possibly overlooked undershrub of seasonally dry forest growing between 450 and 1700 m from northern Argentina north to the Yungas of La Paz, with an almost identical distribution to *Oplonia jujuyensis* with which it sometimes grows. Flowers for a short period late in the dry season around September-October.

Specimens examined: LA PAZ: Sud Yungas, San Bartolomé, *Krukoff 10334* (K, MO, NY, US); Chulumani, *Beck 4725*, *12625* (LPB, US); *Kessler 5814* (LPB, US). SANTA CRUZ: Florida, Samaipata, *J. Steinbach 8180* (BM, MO, UC, US), *Fosberg 28629* (US), *Nee 35200* (NY, US). CHUQUISACA: Tomina, *Beck 9353* (LPB, US), *Wood 12593* (K, LPB, US); Siles, *Kessler 4970* (LPB, US).

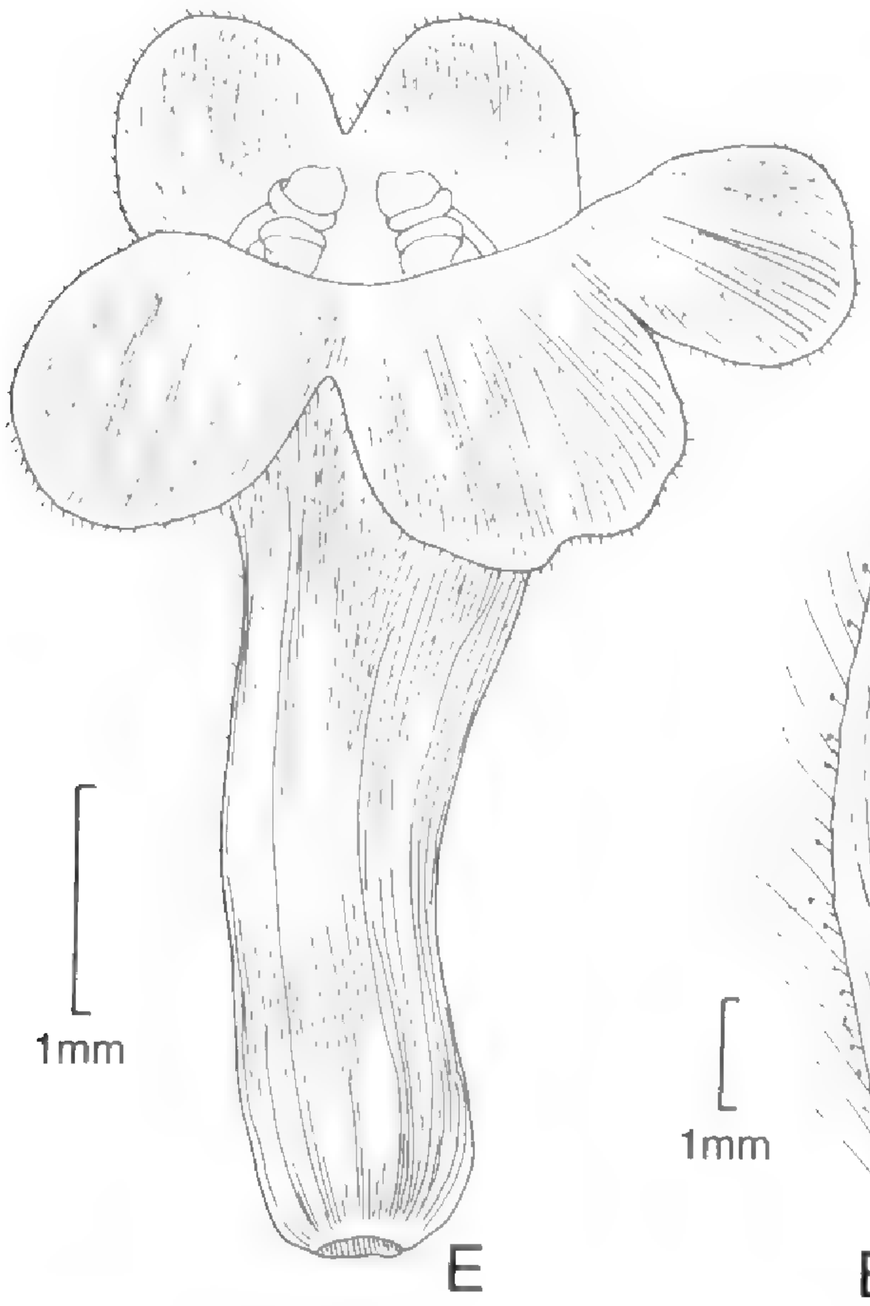
30. **Staurogyne** Wall.

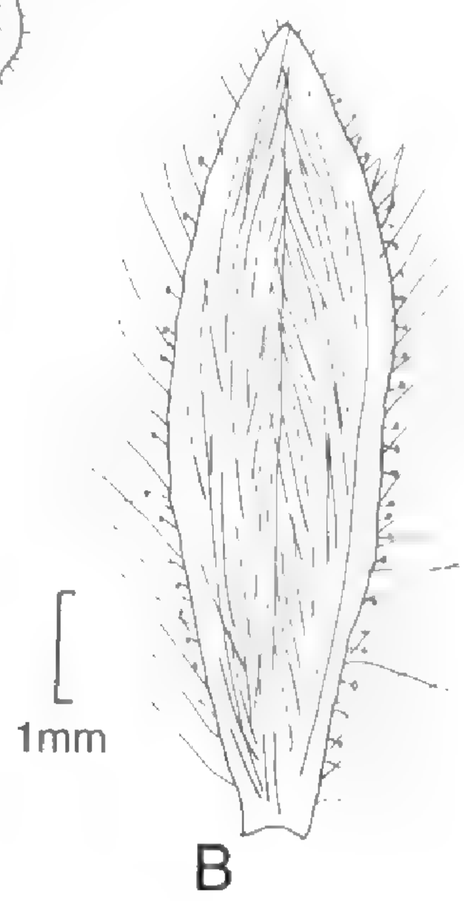
Staurogyne diantheroides Lindau, Bull. Herb. Boiss., ser. I, 5:645. 1897. TYPE: Bolivia, Santa Cruz, Velasco, *Kuntze s.n.* (holotype B, destroyed; F photo 5863; isotypes NY, US-702151).

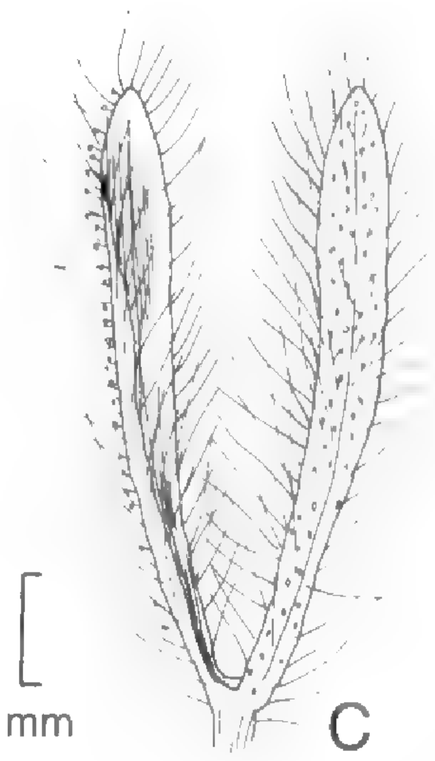
Lepidagathis justicioides Britton ex Rusby, Bull. Torrey Bot. Club, 27:76. 1900. TYPE: Bolivia, La Paz, Larecaja, Guanay, *Rusby 2563* (holotype NY; isotypes MO, US-1320227). Fig. 32.

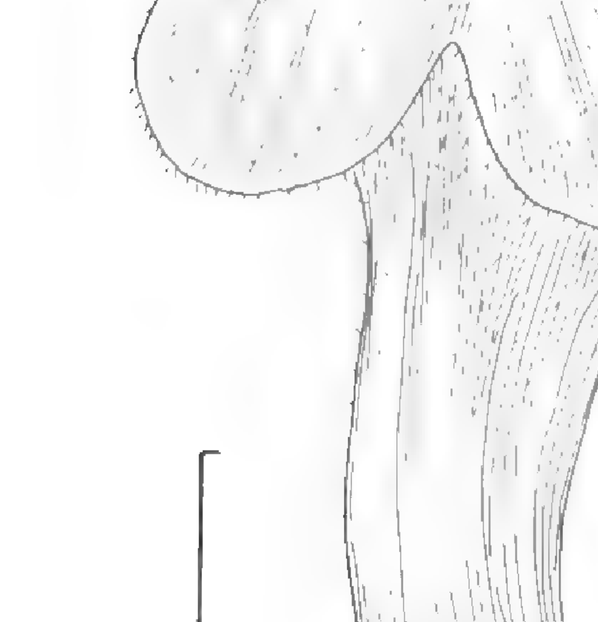
Low-growing herbs or shrubs, 10-30 cm; stems reddish, terete, white-pilose; leaves petiolate, blades narrowly oblong, 5 x 1 cm, subglabrate, lateral veins hirsute-pilose, margin entire; inflorescence of dense, multiflowered, terminal spikes exceeding cauline leaves; bracts oblong, 5 x 2.5 mm, green, pubescent, margin entire; bracteoles 2, lanceolate, 5 x 0.75 mm, pilose; flowers milk-white; calyx deeply 5-lobed, lobes equal, 4-5 x 0.75 mm, pilose; corolla 7-8 mm long, tube funnelform, 4 mm long, limb subbilabiate, lower lip (anterior) 3-lobed, 2 x 1 mm, curved inward in bud and overlapping upper lip, upper lip (posterior) 1 mm long, bifid; stamens 4, included; anthers 2-thecous, muticous at base; capsule oblong, obtuse, nonstipitate, seed-bearing nearly its entire length; seeds numerous (25-30).

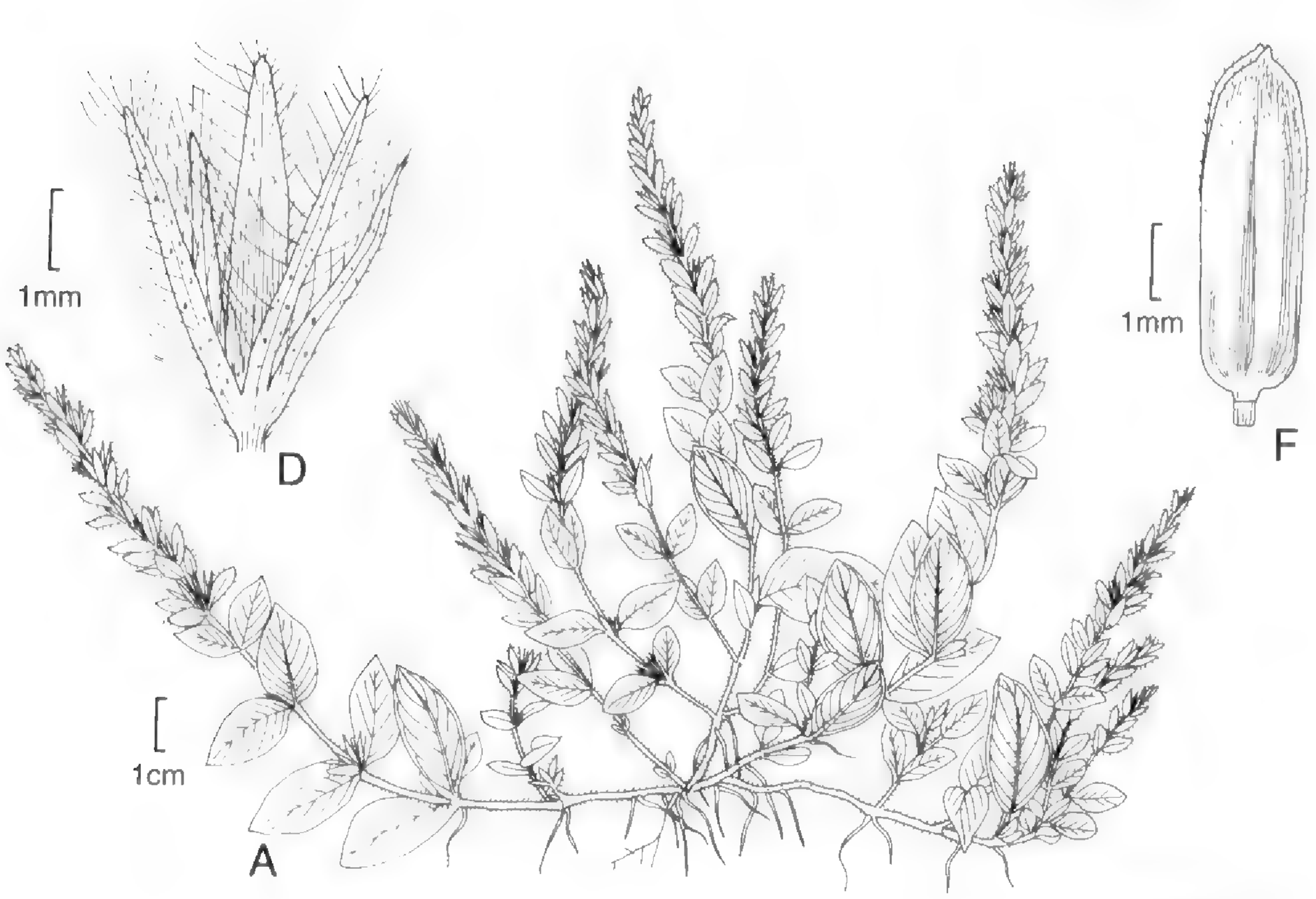
Widespread but perhaps commonly overlooked in seasonally in Bolivia and Brazil, inundated depressions of flat sandy areas in cerrado or scrub vegetation between 150-500 meters. Flowering











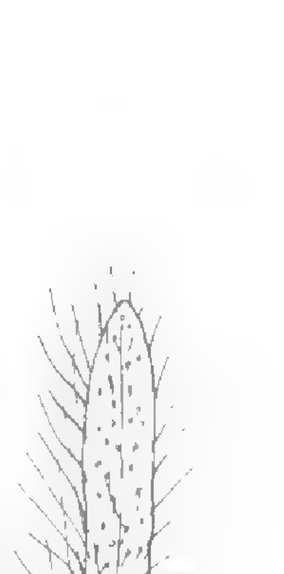


Fig. 32. *Staurogyne diantheroides*. A. Habit. B. Bract. C. Bracteoles. D. Calyx lobes. E. Corolla and anthers. F. Capsule. (A-E, from *R. Abbott 16973*, US; F, from *M. Nee 41598*, US).

during the winter dry season when its habitat is almost dry.

Specimens examined: BENI: Yacuma, *Beck 16932* (LPB, US); Ballivián, Espíritu, *Beck 5628* (LPB, US); San Borja, *Beck 12167* (LPB, US). LA PAZ: Iturralde, *Wasshausen & Wood 2181* (CAS, GOET, K, LPB, NY, US), *Wood & Wasshausen 13836* (K, LPB, US). SANTA CRUZ: Velasco, Estancia Flor de Oro, *Nee 41396*, 41413 (MO, NY, US), *Gutiérrez 1279* (MO) ; Ñuflo de Cháves, San Ramón, *Nee 41598* (MO, NY, US); Perseverancia, *Wood 10052* (K, LPB); Sara, Bañado de Dolores, *J. Steinbach 2479* (LIL, US), Ichilo, *Wood & Menacho 12689* (K, LPB, US); Caballero, *Abbott 16973* (MO, US).

31. **Stenandrium** Nees

Perennial acaulescent or caulescent herbs lacking cystoliths; leaves opposite or quaternate, sessile or petiolate, blades with margin entire to subcrenate; inflorescence of axillary or terminal elongated or headlike usually pedunculate dichasiate spikes, dichasia opposite or alternate, 1-flowered, sessile, subtended by bracts; bracts opposite or alternate, green, margin entire; flowers subtended by 2, sessile bracteoles; calyx deeply 5-lobed, lobes equal or subequal; corolla pink, purple, or white, tube expanded distally into a short throat, throat pubescent within, limb appearing subactinomorphic to bilabiate, upper lip 2-lobed, lower lip 3-lobed, corolla lobes imbicate in bud; stamens 4, subdidynamous, inserted in upper part of corolla tube, the anthers 1-thecous, lacking basal appendages, connivent in pairs, apically bearded pilose; style included in corolla tube; stigma asymmetrically funnelform; capsule estipitate to substipitate, ellipsoid to obovoid, retinacula present, septa with attached retinacula remaining attached to inner wall of mature capsule; seeds 4, lenticular, often with barbed or branched trichomes.

Key to the Species of **Stenandrium**

1a. Plants caulescent ..... *S. mandioccanum*
1b. Plants acaulescent 2

2a. Inflorescence a subsessile or petiolate spike; petiole to 5 cm long (usually much shorter); bracts lanceolate to elliptic, 2-3.5 mm wide, conspicuously 3-nerved ..... *S. dulce*
2b. Inflorescence a long-pedunculate spike; peduncles 7-13 cm long; bracts narrowly ovate, 3.5-6 mm wide, not conspicuously 3-neved ..... *S. pohlii*

Stenandrium dulce (Cav.) Nees, in DC., Prodr. 11:282. 1847. - *Ruellia dulcis* Cav., Icon. Pl. 6:62, t. 585, fig. 2. 1801. - *Gerardia dulcis* (Cav.) Blake, Contrib. Gray Herb. 52:101. 1917. TYPE: Chile, Concepción, near Talchuano, *Cavanilles s.n.* (holotype MA).

Stenandrium diphyllum Nees, (sub. var. *longiscapum* Nees) in Mart., Fl. Bras. 9(7): 75. 1847. SYNTYPES: Brazil, São Paulo, *Riedel 50* (syntype LE); Itarare, *Riedel 281* (syntype LE).

Stenandrium diphyllum var. â *exscapum* Nees, in Mart., Fl. Bras. 9(7):75. 1847. TYPE: Brazil, Alacriportum, *Sellow s.n.* (holotype B, destroyed).

Stenandrium trinerve Nees var. â Nees, in Mart., Fl. Bras. 9(7):75. 1847. - *Stenandrium neesianum* Lindau, in Engl. & Prantl, Nat. Pflanzenfam. 4(3B):321. 1895. SYNTYPES: Brazil, Rio Grande do Sul, Porto Alegre, *Sellow 85, 3275, 3464* (syntypes B, destroyed; isosyntypes K).

Stenandrium trinerve Nees var. ã Nees, in Mart., Fl. Bras. 9(7): 75. 1847. SYNTYPES: Uruguay, Montevideo, Santa Luciam, *Sellow 84, d.301* (syntypes B, destroyed; isosyntypes K).

Acaulescent herb 2-20 cm, roots thick-fibrous; leaves petiolate, blades ovate to oblong-ovate or oblong-elliptic, 1.3-2.5 x 0.7-1.6 cm, ± glabrate and glossy above, pubescent below, margin entire; inflorescence a subsessile or petiolate, headlike or usually somewhat elongated spike; petiole to 5 cm long (usually much shorter); bracts lanceolate to elliptic, 8-13 x 2-3.5 mm, conspicuously 3-nerved, margin ciliate; bracteoles lance-subulate

3 x 0.5 mm; calyx lobes subequal, lance-subulate, 3.5-6 x 0.5-1 mm, striate-nerved; corolla pink to purple, marked with white within, 11-20 mm long, tube cylindric, slender, 7-12 mm long ± incurved and briefly ampliate at throat, glabrous, limb oblique, spreading, 5-lobed, lower-central lobe usually pubescent on abaxial surface, upper lip bilobed, all lobes obovate, 2.5-6 x 3-4 mm, retuse; capsule oblong to subfusiform. A very variable species.

Widely distributed throughout South America although principally in the Andes. It grows in dry country in specialized open grassy or sandy places where water accumulates and drains after rain where it is commonly associated with *Hypoxis*, *Desmanthus* and other species. It grows higher than any other Acanthaceae in Bolivia reaching about 3200 m but also grows in the lowlands at around 300 m. It is extremely rain-sensitive, flowering massively after the first substantial rains in spring in September-December and sporadically at other times after rain.

Specimens examined: LA PAZ: Larecaja, *Buchtien 1101* (K, MO); Zongo, *Bang 891* (BM, K, MO, NY, US); Sorota, *Mandon 299* (K); Murillo, *Beck 3028* (LPB, US). COCHABAMBA: *J. Steinbach 5999* (LIL, US), *Cutler 7459* (US); Cercado, *Cárdenas 7396* (US); Capinota, *Wood & Goyder 17048* (K, LPB); Arani, *Wood 18954* (LPB, BOL, K); Carrasco, Pocona, *J. Steinbach 8658* (BM, K, MO); Mizque, Vila Vila, *Brooke 5848* (BM). SANTA CRUZ: Ibáñez, *Nee 42152* (NY, US); Caballero, *Balcázar 79* (MO), *Schmitt 3* (MO, US); *J. Steinbach 8462* (BM, K, MO); *Wood 17782* (K, LPB); Vallegrande, *Wood 15585* (K, LPB); Florida, *Beck 6800* (LPB, US); Cordillera, *Wood & Goyder 16851* (K, LPB); Chiquitos, *Wood & Mamani 13505* (K, LPB), *14089* (K, LPB); *Busch, Wood & Guzman 17373* (K, LPB). CHUQUISACA: Oropeza, Sucre, *Scolnik 626* (US); *Wood 14240* (K, LPB); Yamparaez, *Beck 6209* (LPB, US), *Wood 17846* (K, LPB); Tomina, *Wood 8786* (K, LPB, US); Zudáñez, *Brooke 5766* (BM). TARIJA: Gran Chaco, Villamontes, *Pflanz 2140* (US); Cercado, *Bastian 12* (LPB, US); Mendez, *Wood 16727* (K, LPB); Arce, *Beck 14301* (LPB, US); Exp. E. Incl. 2, *Liberman 2083* (LPB, US). POTOSI: Charcas, *Wood, Atahuachi & Mercado 19260* (LPB, BOL, K); Sud Chichas, Tupiza, *Cárdenas 340* (US). WITHOUT PRECISE LOCALITY: Araca valley slopes, *Herzog 2367* (L); Bolivian Plateau, *Bang 967* (BM, K, MO, NY, US).

Stenandrium mandioccanum Nees, in Mart., Fl. Bras. 9(7):76. 1847. TYPE: Brazil, Rio de Janeiro, Serra dos Orgaos, *Sellow s.n.* (syntype B, destroyed; F photo 8684; isosyntypes BM, K). Fig. 33.

Stenandrium spathulatum S. Moore, Trans. Linn. Soc. Ser. II, Bot. 4:427. 1895. TYPE: Brazil, Mato Grosso, Corumbá, *S. Moore 958* (holotype BM). Fig. 33.

Caulescent herb 8-20 cm, rhizomes horizontal, stems erect, hirtellous; leaves petiolate, blades ovate, 1.5-4 x 1-2 cm, moderately firm, discolorous, hirtellous, margin entire; inflorescence terminating main and lateral branches, the spikes several, pedunculate; bracts obovate to spathulate, 6-10 x 4-6 mm, 3 to 5 nerved, hirtellous, margin ciliate; bracteoles small, narrowly triangular, somewhat shorter than calyx lobes; calyx 5 mm long, lobes subequal, narrowly triangular, hirtellous, striate-nerved; corolla light purple, lilac or rose colored, 10-14 mm long, sparingly puberulous, throat puberulous within, tube enlarged into an obconic throat 3 mm wide at mouth, limb oblique, spreading 5-lobed, lobes 3-6 mm long, anterior (lower) somewhat larger and much wider; capsule conic, puberulous.

Widely distributed in Ecuador, Peru, Brazil, Paraguay and northern Argentina as well as in much of Bolivia but sporadic in occurrence growing in scattered localities in dry forest principally in the Andes and around the chaco. It flowers mostly after the spring rains in October and November but sporadically at other seasons.

Specimens examined: LA PAZ: Larecaja, *Wasshausen & Wood 2201* (CAS, GOET, K, LPB, NY, US), *Wood & Wasshausen 13909* (K, LPB); Inquisivi, *Lewis 36966* (LPB, MO). SANTA CRUZ: Velasco, *Seidel 87* (LPB, US); Chiquitos, *Wood & Mamani 14085* (K, LPB, US), *Wood & Wendelberger 17201* (K, LPB); Busch, *Wood & Guzman 17386* (K, LPB, US); Cordillera, *Nee 51371* (NY, US). TARIJA: Gran Chaco, *Beck 11480, 11608* (LPB, US); Villamontes, *Herzog 1118* (L).

Stenandrium pohlii Nees, in Mart. Fl. Bras. 9:75. 1847. TYPE: Brazil, Goiás, Corrego-Piau, *Pohl 2136* (syntype W).

Acaulescent, scapose herb 10-20 cm, roots thick-fibrous; leaves in a rosette, short-petiolate, blades oblong to elliptic to narrowly obovate, 7-10 x 2-4 cm, moderately hirsute, sometimes

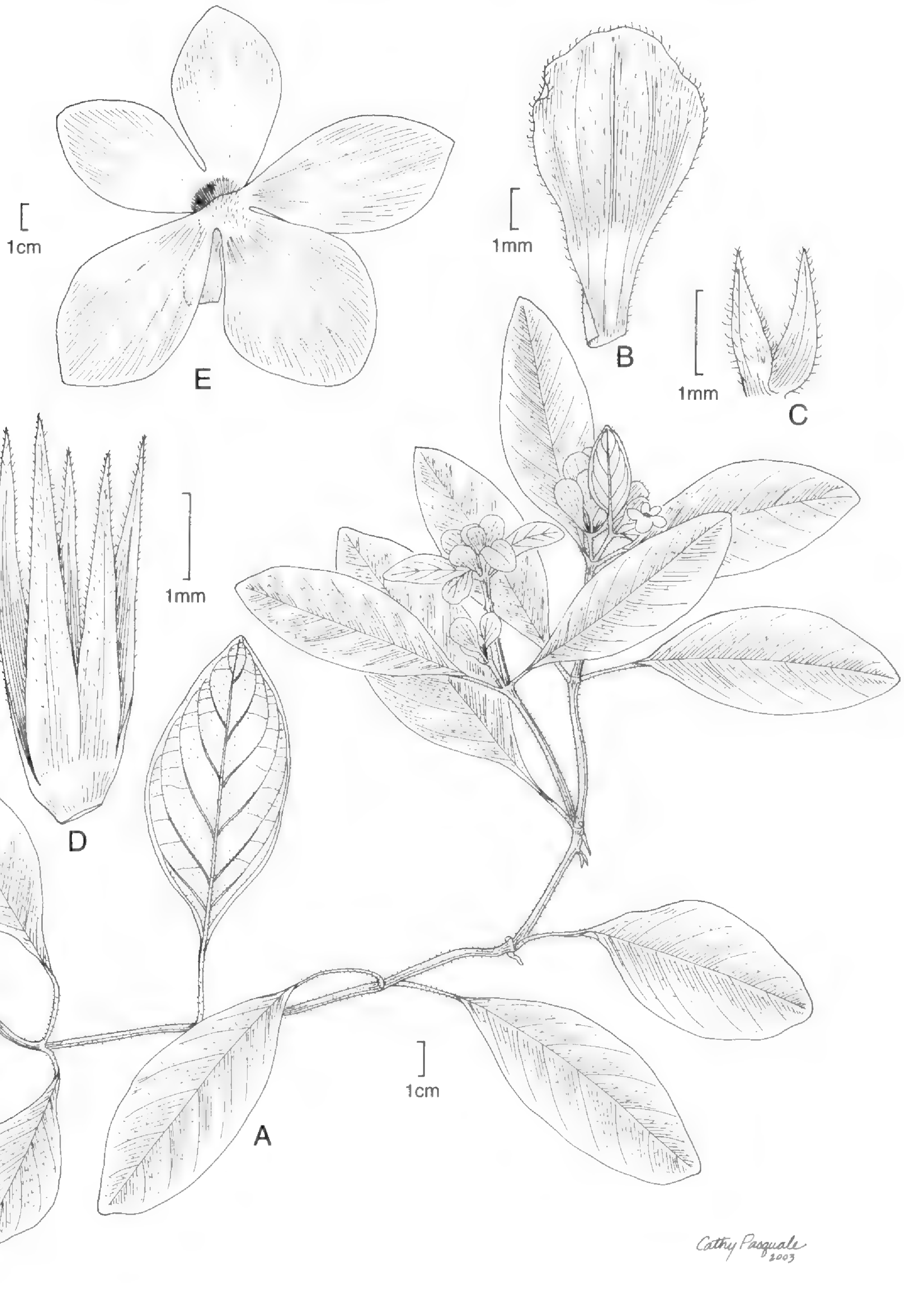


Fig. 33. *Stenandrium mandioccanum*. A. Habit. B. Bract. C. Bracteoles. D. Calyx lobes. E. Corolla. (A, from *D. Wasshausen & Wood 2201*, US, B-E, from *M. Nee 51371*, US).

reddish, both above and below, apically obtuse, attenuate into a short petiole at base; inflorescence a solitary, terminal, long-pedunculate, subcylindric spike, 3-8.5 cm long without the peduncle; peduncle subquadrangular, 7-13 cm long, hirsute; bracts narrowly ovate, 9-12 x 3.5-6 mm, sessile, distinctly hirsute and gland-dotted, acute to obtuse, sometimes mucronulate at apex, distinctly ciliate; bracteoles narrow and small; calyx lobes subequal, lanceolate, 6-7 x 1 mm, striate; corolla pink, white and pale blue or rose-colored, 17-22 mm long, tube cylindric, slender, 7-8 mm long, limb oblique, spreading, 5-lobed, 13-16 mm wide, oval, obtuse; capsule oblong to subfusiform, 10 x 4.5 mm, puberulous; seeds lenticular, conspicuously pubescent with barbed or branched trichomes.

A cerrado species of eastern Bolivia and Brazil growing in bushy cerrado on sandy soil. Flowers after the first rains in September to November.

Specimens examined: Santa Cruz: Chiquitos, *Wood & Mamani 14089* (K); Ñuflo de Chávez, *Wood 17632* (K, LPB, US).

32. **Stenostephanus** Nees

Erect or spreading herbs or shrubs with cystoliths; leaves opposite, petiolate, blades usually rather thin, those subtending the inflorescence often reduced and sessile, margin entire to crenulate to sinuate; inflorescence consisting of terminal and axillary dichasiate spikes, racemes, thyrses or panicles with the dichasia opposite, subopposite or alternate, 1-3-many flowered, flowers sessile or pedunculate, subtended by a small bract; bracts opposite, green, inconspicuous with entire margin; bracteoles 2; calyx deeply 5-lobed, the lobes equal or subequal, often accrescent in fruit; corollas 1- or 2-colored, with the colors various (usually ed, pink, yellow, cream-colored), the tube cylindric or distally gradually or abruptly expanded into a throat, the narrow proximal portion (if distinct) shorter than throat, throat sometimes prominently saccate, urceolate to subcylindric, limb can be 1-labiate or bilabiate, upper lip usually entire or emarginate, sometimes bifid, erect or recurved, lower lip 3-lobed or truncate and minutely 3-fid or essentially absent, corolla lobes imbricate in bud; stamens 2, inserted near apex of corolla tube or near base of throat, exserted from mouth of corolla; anthers 1-thecous, glabrous, muticous; staminodes 0; style exserted from mouth of corolla; stigma minute ± swollen, lobes not evident; capsule stipitate, head ovoid to subellipsoid (sometimes with a slight medial constriction, retinacula present, septa with attached retinacula remaining attached to inner wall of mature capsule; seeds 4, homomorphic, sublenticular to lenticular, lacking trichomes.

Neotropical genus of about 70 species occurring primarily at relatively high elevations (usually between 1700-2450 m) from western Mexico to Bolivia. The genus reaches its greatest diversity in Colombia. Species of *Stenostephanus* are local, elusive and rarely collected. Many are known only form the typecollection. They occur in Bolivia along streams (quebradas) or in swampy ground in primary forest.

Key to the Species of **Stenostephanus**

1a. Corolla distinctly 2-lipped; inflorescence an open panicle 2
1b. Corolla subequally lobed, not obviously 2-lipped; inflorescence a spike or raceme or a very narrow racemose panicle 4

2a. Corolla dark-red, 15-16 mm long ..... *S. cochabambensis*
2b. Corolla yellow-green or white, < 14 mm long 3

3a. Corolla yellow-geen, completely glabrous, > 10 mm long ..... *S. pyramidalis*
3b. Corolla white with a line of trichomes in tube ..... *S. davidsonii*

4a. Corolla yellow or yellow-green; flowers sessile; inflorescence spicate 5
4b. Corolla red, pink or pale lilac; some or all flowers pedicellate; inflorescence a raceme or a narrow, racemose panicle 6

5a. Plant pubescent; corolla 8-9 mm long; anthers included ..... *S. krukoffii*
5b. Plant glabrous or nearly so; corolla 6.5 mm long; anthers shortly but distinctly exserted ..... *S. spicatus*

6a. Corolla pale lilac, < 15 mm long, lobes spreading, about half as long as tube ..... *S. tenellus*
6b. Corolla dark pink or red, > 15 mm long, lobes erect, many times shorter than tube 7

7a. Plant glabrous ..... *S. crenulatus*
7b. Plant pubescent or pilose 8

8a. Inflorescence of long narrow racemes, usually 10-20 cm in length, corolla weakly ventricose ..... *S. lyman-smithii*
8b. Inflorescence a narrowly ovoid, racemose panicle rarely exceeding 10 cm in length; corolla strongly ventricose ..... *S. longistaminus*

Stenostephanus cochabambensis Wassh., Harvard Papers Bot. 4:282. 1999. TYPE: Bolivia, Cochabamba, Chapare, Ca. 9 km along road to Corani Pampa from Cochabamba to Chapare higway by junction of Río Derrumbe Mayo and Río Aliso Mayo, *Wood & Ritter 9939* (holotype US-3348686; isotypes K, LPB). Fig. 34.

Plant vigorous leggy perennial herb, 0.8-2 m high, becoming leafless at maturity; stems ascending/decumbent from which arise erect flowering shoots, younger stems moderately pilose, older stems glabrate, with swollen nodes; leaves petiolate, blades dark green, ovate to elliptic, 5.5-10 x 3.5-6 cm, moderately pilose, apex acute to shortly acuminate; inflorescence purplish, terminating main and lateral branches; flowers numerous, borne in a compact, elongate thyrse 7-10 cm long and 4-6 cm in diam.; bracts green, lance-subulate, 4-7.5 x 1-2 mm, pilosulous; bracteoles purplish, linear-subulate, 3.5-5.5 x 0.4-0.5 mm; calyx purplish, 6-11 mm long (accrescent in fruit), lobes linear-lanceolate; corolla dark-red, 15-16 mm long, glabrous, tube cylindrical, slightly expanded distally, 10-11 mm long, 1.5 mm in diam. at base, upper lip erect, lanceolate, apically entire, sometimes slightly reflexed; stamens exserted beyond mouth of corolla, equaling upper lip; capsule 11-12 mm long, glabrous, stipe 6-7 mm long; seeds whitish, lenticular.

A rare endemic species of moist cloud forest of the Chapare-Carrasco escarpment in Cochabamba Department. Flowers from about March to July. This species should be regarded as vulnerable within the IUCN classification.

Specimens examined: COCHABAMBA: Chapare, *Ritter & Wood 2328* (LPB, NHA), *Wood & Ritter 9923* (K, US); Tiraque, *Kessler 7101* (LPB, US). SANTA CRUZ/COCHABAMBA: "Vallegrande", but probably from San Mathias *Cárdenas 5128* (LIL, US). WITHOUT PRECISE LOCALITY: *Bridge s.n.* (BM); *Kuntze s.n.* (1892) (NY).

Stenostephanus crenulatus (Britton ex Rusby) Wassh., Harvard Pap. Bot. 4:288. 1999. - *Hansteinia crenulata* Britton ex Rusby, Mem. Torrey Bot. Club 4:242. 1895. TYPE: Bolivia, La Paz, Yungas, *Bang 641* (holotype NY; isotype US-1320362).

Herbaceous or suffrutescent, glabrous, 1-2 m; stem and branches slender, erect, angled above; leaf blades oval to ovate-oval, 10-25 x 5-8 cm, thin and membranous, margin obscurely crenate; inflorescence a terminal, lax panicle 10-20 cm long; bracts small, triangular-subulate; bracteoles minute or none; flowers erect, spreading or partially nodding; calyx accrescent, rotate, lobes equal, linear, 3 mm long; corolla scarlet or dark-pink, saccate, 17-20 mm long, tube narrow basally, abruptly expanded into an oblong or barrel-shaped throat, slightly contracted below limb, lips short, 2 mm long, lower lip shallowly 3-lobed, lobes erect, upper lip shorter, recurved and concave, entire; capsule oblong, contracted and stipiform at base.

Endemic but locally frequent in moist cloud forest in the Yungas area at elevations between 1400-1500 meters. Flowers mainly in the rainy season from February to May.

Specimens examined: LA PAZ: Tamayo, *Boeke 1466* (LPB, NY, US); Saavedra, *Kessler 9783* (LPB, US), *Wasshausen & Wood 2271, 2306* (LPB, US); *Wood & Harley 18146* (K, LPB); Larecaja, Mapiri, *Rusby 1103* (BM, K, MO, NY, US), Mapiri Region, San Carlos, *Buchtien 1362* (NY, US), *Solomon 17683* (MO,

Fig. 34. *Stenostephanus cochabambensis*. A. Habit. B. Thyrse with bracts, bracteoles, calyx lobes and corolla. C. Bracteoles and calyx lobes. D. Corolla and stamens. (A-D, from *J.R.I. Wood & Ritter 9939*, US).

NY, US); Caranavi, *Wood & Mondaca 14538* (K, LPB), *14551* (K, LPB); Nor Yungas, *Smith & García 13904* (LPB, MO), *Solomon 9506* (MO, NY, US), *18423* (LPB, MO), *14828* (MO, NY, US), *Buchtien 3907* (K, US), *Rusby 1818* (NY, US), *Gentry 44299, 44518* (MO, US); Yungas, *Bang 640* (K), *641* (NY); Sud Yungas, *Wood 8921* (K, LPB). WITHOUT CONFIRMED LOCALITY: *Bang 875* (BM, K, MO, NY, US).

Stenostephanus crenulatus (Britton ex Rusby) Wassh. var. **longiflorus** Wassh. & J. R. I. Wood, Harvard Pap. Bot. 6:453. 2001. TYPE: Bolivia, Sud Yungas, 9 km from Huancané along road to San Isidro, 2540 m, 12 Dec 1989, *D. N. Smith & V. García 13904* (holotype LPB; isotype MO). Fig. 35.

Distinguished from var. *crenulatus* by its 30 mm long corolla. Known only from an isolated locality at the southern extreme range of *Stenostephanus crenulatus*. This new variety occurs in moist cloud forest at a much higher altitude than is normal for typical *S. crenulatus*. However, in the type locality typical examples of *S. crenulatus* also occur (*Wood 8921*).

Stenostephanus davidsonii Wassh., Harvard Pap. Bot. 4: 285. 1999. TYPE: Bolivia, La Paz, Nor Yungas, 16.2 km SW of Yolosa jct., toward Unduair, *Davidson 4973* (holotype LAM). Fig. 36 (A-D).

Herbaceous, somewhat succulent, to 1 m high; stems terete or subquadrangular, glabrate to glandular-pilose; leaves petiolate, blades thin, elliptic to narrowly ovate, 11-14 x 5-5.5 cm, apex acuminate; leaves subtending inflorescence reduced; inflorescence paniculate, panicles terminal and axillary, lax, forming a large complex inflorescence to 20 cm long, 7 cm wide; peduncles and pedicels densely pilose, trichomes purplish; bracts subtending flowers green, triangular-subulate, 1 x 0.5 mm, pilosulous; bracteoles green, triangular-subulate, 2 x 0.5 mm; calyx accrescent, 4-5.5 mm long, pubescent, lobes linear-lanceolate; corolla white, 7-8 mm long, glabrous, tube slightly expanded distally, 4-4.5 mm long, 2-2.5 mm in diam. at mouth, upper lip erect, narrowly ovate, apically entire, lower lip 2.5-3.5 mm long, lobes narrowly obovate, 1 x 1 mm; stamens just barely exserted beyond mouth of the corolla, glabrous.

Humid cloud forest at elevations between 2400-2900 meters from four scattered localities in southern Peru and northern Bolivia. Flowers during the rains from about November to April. This plant is rare and threatened in its few known localities.

Specimens examined: LA PAZ: Inquisivi, *Lewis 39111* (LPB, MO). COCHABAMBA: Ayopaya, *Wood & Zarate 16621* (K, LPB).

Stenostephanus krukoffii Wassh., Harvard Papers Bot. 4:282. 1999. TYPE: Bolivia, La Paz, Sud Yungas, basin of Río Bopi, San Bartolome (near Calisaya), *Krukoff 10400* (holotype US-177816; isotype NY).

Herbaceous to 1 m high; profusely branching; stems terete or subquadrangular, pubescent; leaves petiolate, blades thin, elliptic to narrowly ovate, 10-17 x 4-4.5 cm, glabrate above, pubescent below, apex acuminate; leaves subtending inflorescence reduced; inflorescence spicate, spikes solitary, pedunculate, 15-17 cm long, peduncles puberulous and glandular-pilose, rachis pubescent; flowers opposite or subopposite along spike axis; bracts greenish, lanceolate, 2-4 x 0.5-0.6 mm, pubescent; bracteoles subulate, 2 x 0.5 mm, greenish; calyx pubescent, lobes lance-subulate, 4-5 x 0.5-0.6 mm; corolla cream-colored to cream-yellow, 8-9 mm long, externally pubescent with multicellular trichomes, tube 6.5-7 mm long, slightly expanded distally, 2-3 mm wide at mouth, upper lip erect, apically emarginate; stamens just barely exserted beyond corolla lips,
glabrous.

A rare endemic species of very moist cloud forest in the Yungas of La Paz. Flowers during the winter dry season from July to September. It should be regarded as vulnerable within the IUCN classification.

Specimens examined: LA PAZ: Tamayo, *Wasshausen 2298* (LPB, US); Caranavi, *Wasshausen 2210* (CAS, GOET, K, LPB, NY, US), *Beck 9244* (LPB, US), *Kessler 11311* (LPB, US).

Stenostephanus longistaminus (Ruiz & Pav.) V. M. Baum, Brittonia 34:433. 1982. - *Justicia longistaminus* Ruiz & Pav., Fl. Peruv. Chile.

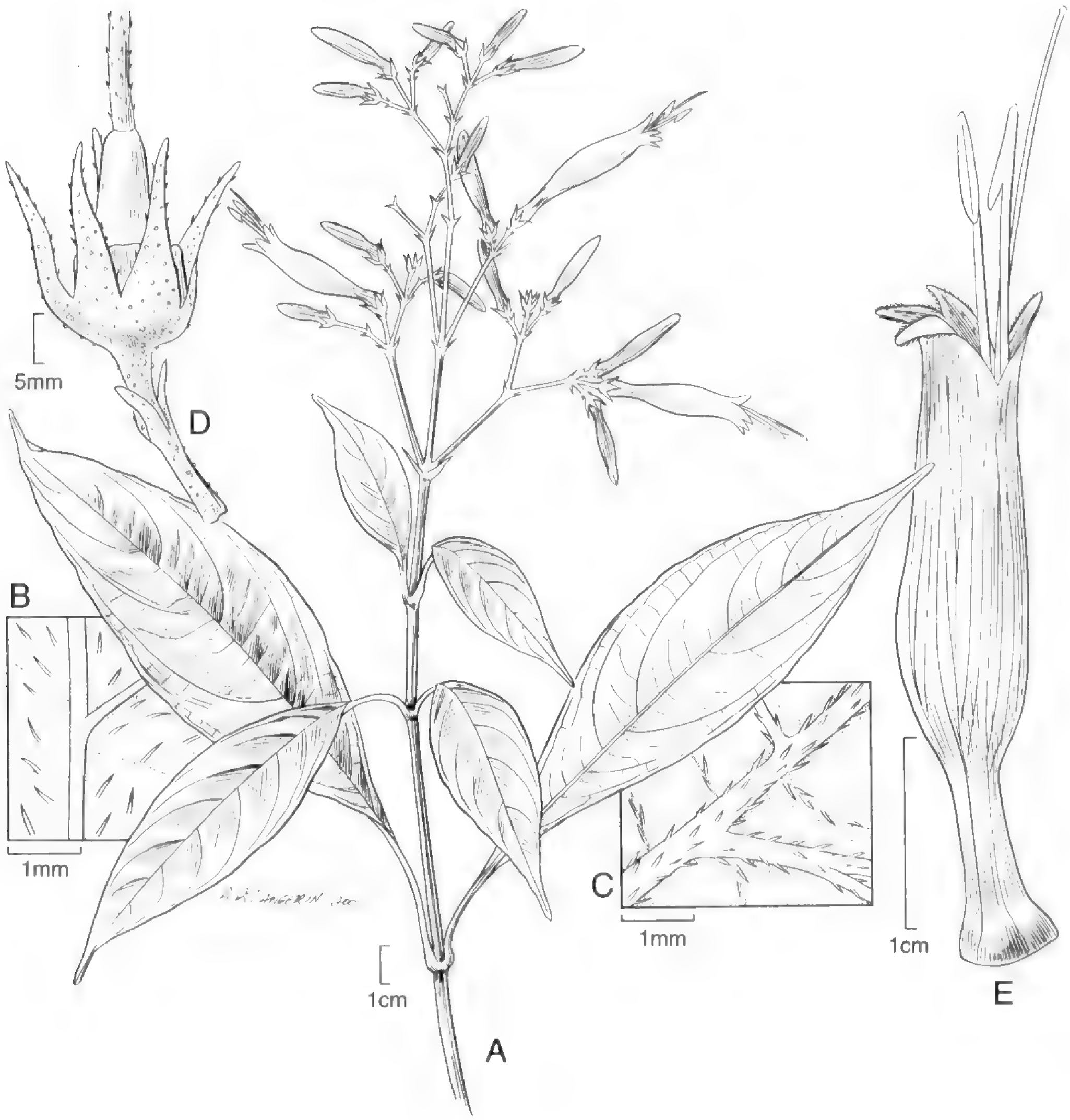


Fig. 35. *Stenostephanus crenulatus* var. *longiflorus*. A. Habit. B. Enlargement of lower leaf blade indumentum. C. Enlargement of upper leaf blade indumentum. D. Bracteoles, calyx lobes and ovary. E. Corolla. (From *D.N. Smith & Garcia 13904*, MO).

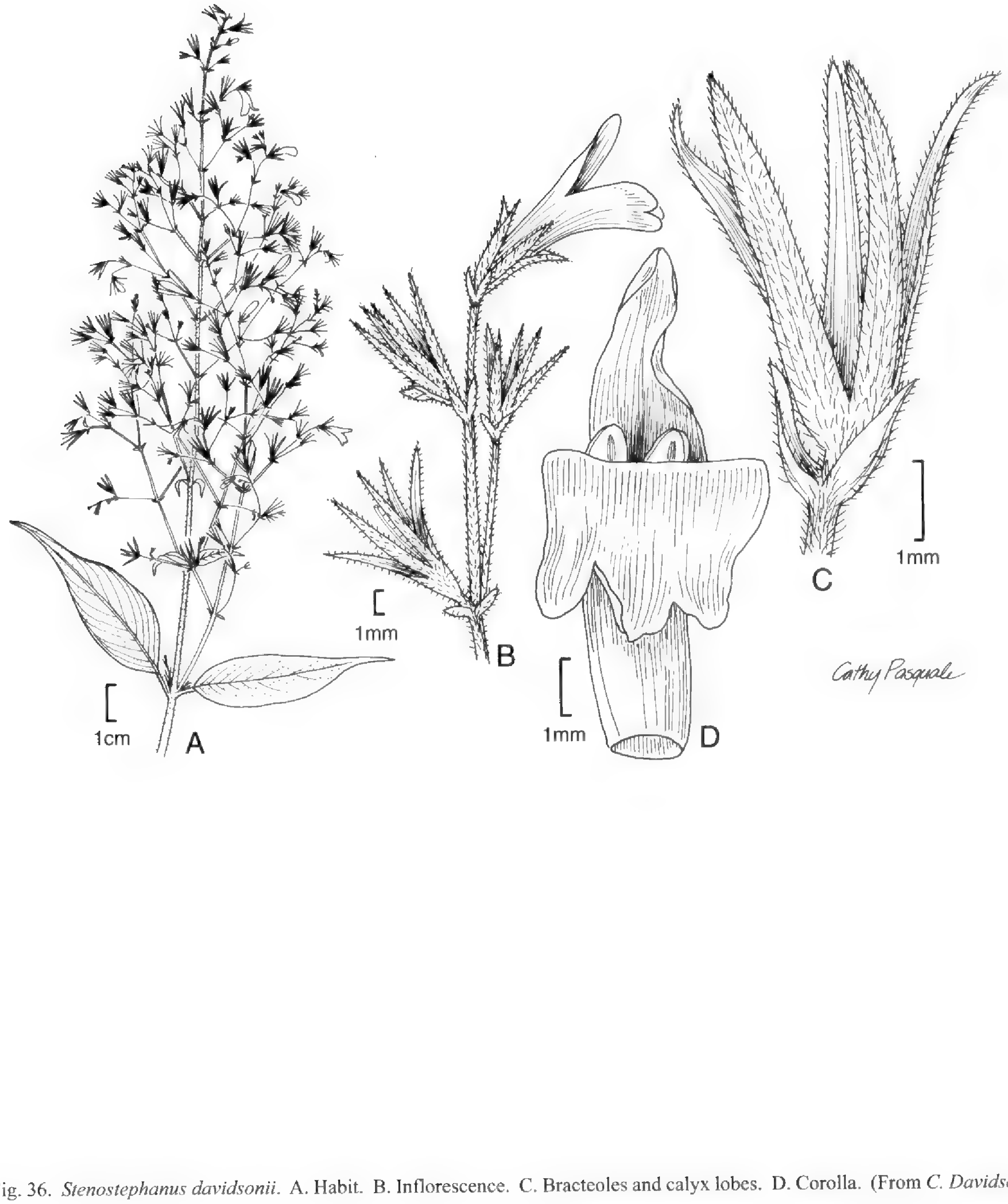


Fig. 36. *Stenostephanus davidsonii*. A. Habit. B. Inflorescence. C. Bracteoles and calyx lobes. D. Corolla. (From *C. Davidson 4973*, LAM).

1:8. 1798. - *Thyrsacanthus longistaminus* (Ruiz & Pav.) Nees, in DC., Prodr. 11:326. 1847. TYPE: Peru, "Andium Pillaensium nemoribus ad Pampamarca", *Ruiz s.n.* (holotype probably MA; F photo 8736; isotype G).

Stenostephanus thyrsoides Lindau, Notizbl. Bot. Gard. Berlin 6:198-9. 1914. TYPE: Brazil, Amazonas, Río Acre, Seringal Auristella, *Ule 9795* (holotype B, destroyed; isotypes K, UC).

Stenostenhanus bolivianus Rusby, Mem. N.Y. Bot. Gard. 7:366. 1927. TYPE: Bolivia, La Paz, Ixiamas, *Cárdenas 19O5* (holotype NY, isotype K).

Suffruticose, 40-80 cm; stems quadrangular, unbranched, bifariously pilose; leaf blades oblong to ovate, 15-30 x 8-15 cm, glabrous, thin, margins irregularly crenate; inflorescence terminal, thyrsoid, long-pedunculate, solitary, made up of axillary, contracted cymes, peduncles puberulous; bracts varying in size; bracteoles minute; flowers crowded in axils, pedicels 1-3 mm long; calyx lobes equal, linear, minutely puberulous, 5 mm long; corolla bright purple, glabrous, tube 22 mm long, tube-like, upwardly abruptly enlarged and ventricose, limb bilabiate, lower lip short, unequally 3-lobed, lateral lobes 2 x 3 mm, middle lobe 2 x 1.5 mm, upper lip narrow, 5 mm long, entire, erect or recurved; capsule clavate, lower half stipiform, solid and sterile. Very showy plant, its inflorescence often covered with ants.

A rarely collected plant found in (often human-) disturbed non-flooded lowland forest in the SW Amazon basin in Bolivia, Peru and Brazil.

Stenostephanus lyman-smithii Wassh., Harvard Pap. Bot. 4:281. 1999. TYPE: Bolivia, La Paz, Caranavi, *Wasshausen 2155* (holotype US-3362984; isotypes LPB, US). Fig. 37.

Perennial herb, 0.6-1.5 m high; profusely branching; stems ascending, terete or subquadrangular, glabrate; leaves petiolate, blades thin, elliptic to obovate, 10-14 x 3-5 cm, glabrous, apically acuminate sometimes obliquely so; leaves subtending inflorescences distinctly anisophyllous; inflorescence purplish, densely glandular pilose, terminating main and lateral branches, racemose, racemes pedunculate, lax when young, 15-30 cm long; dichasia opposite or subopposite, 1-3-flowered; bracts green, triangular to subulate, 3.5-4 x 1.25 mm; flowers pedicellate; calyx purplish, 7-11 mm long; corolla wine-red, 17-18 mm long, inconspicuously pilosulous, tube abruptly expanded distally into a throat, narrow proximal portion 5-6 mm long, upper lip erect, entire; stamens exserted 9-14 mm beyond mouth of corolla; capsule 12-15 mm long, pilosulous, stipe 6-8 mm long.

An uncommon endemic species of moist cloud forest between 500 and 1900 m in the Serrania de Bella Vista, Pilon Lajas and Madidi National Parks, which also occurs in the Khara Huasi area where the Amboro and Carrasco Parks meet, thus closely paralleling the distribution of *Aphelandra castanifolia*. It flowers during the winter dry season from June to September. Although rare it is not vulnerable within the IUCN classification.

Specimens examined: BENI: Ballivián, *Beck 1692* (LPB, US), *Kessler et al. 10704*, *10765*, *10766* (LPB, US), *Smith & Garcia 14139* (MO). LA PAZ: Iturralde, *Wasshausen 2169* (LPB, K, US), *Wood & Wasshausen 13808* (K, LPB, US); Caranavi, *Garcia et al. 2002* (LPB, US), *Wood & Wasshausen 13780* (K, LPB, US); Sud Yungas, *Wasshausen 2195* (LPB, US), *Wood & Wasshausen 13889* (K, LPB, US). COCHABAMBA: Carrasco, *Wood & Serrano 14860* (K, LPB, US). SANTA CRUZ: Caballero, *I. Vargas 4820* (US, USZ), *Balcazar & Delgadillo 843* (US, USZ).

Stenostephanus pyramidalis (Lindau) Wassh., Harvard Papers Bot. 4: 288. 1999. - *Habracanthus pyramidalis* Lindau, Bull. Herb. Boiss., ser. I, 3:482. 1895. - TYPE: Bolivia, Cochabamba, between Cochabamba & Chimore, *Kuntze s.n.* (holotype B destroyed; F photo 8891). Fig. 38.

Herb or subshrub 1-2 m; younger stems pubescent, older glabrate; leaf blades oblong, 5-14 x 2.5-6 cm, pilose, especially veins on both surfaces, margin subentire; inflorescence terminal, many-flowered, pyramidshaped, paniculate, pubescence transparent; bracteoles varying in length, 3-10 mm long; flowers white, pale yellow or greenish, pedicellate; calyx lobes green, 7-10 x 0.5-1 mm, densely reddish pubescent; corolla tube 1O mm long, gradually enlarged from 2-4 mm, glabrous, lower lip 5 mm long, lobes subequal, lateral 2.5 x 2 mm, middle 3 x 2 mm, upper lip

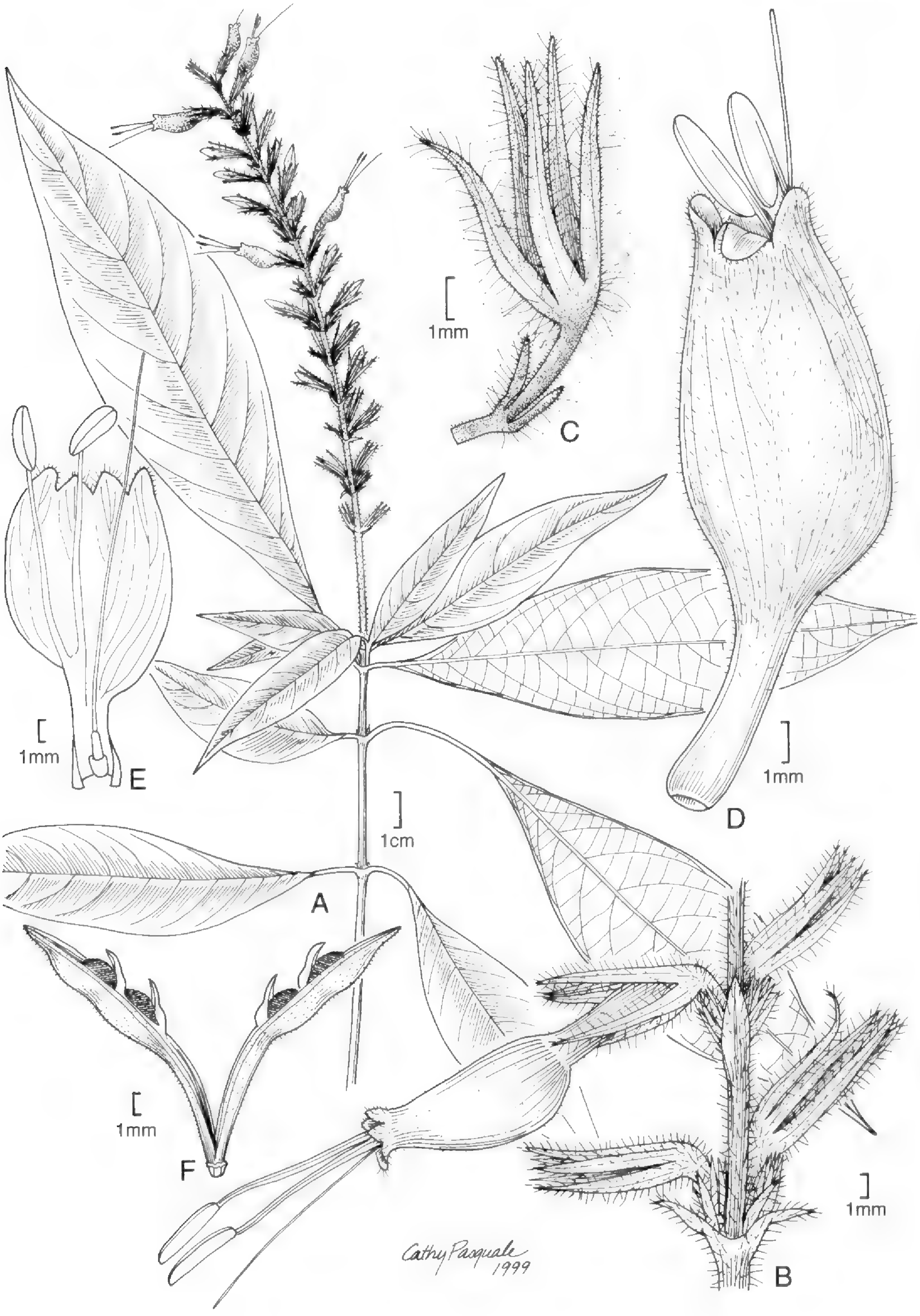


Fig. 37. *Stenostephanus lyman-smithii*. A. Habit. B. Inflorescence. C. Bracteoles and calyx lobes. D. Corolla. E. Corolla expanded. F. Capsule expanded. (From *D. Wasshausen 2155*, US).

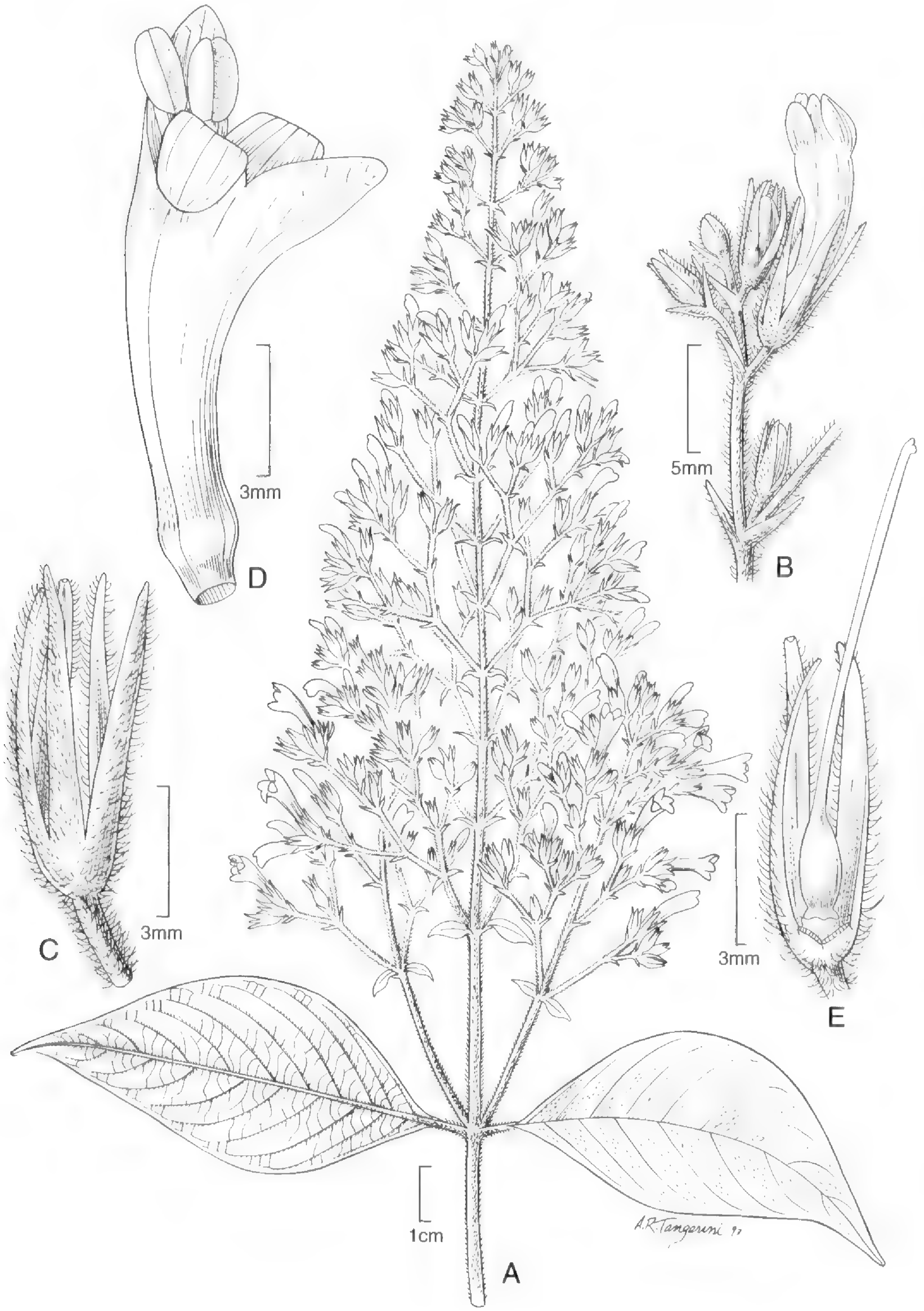


Fig. 38. *Stenostephanus pyramidalis*. A. Habit. B. Thyrse with bracts, bracteoles, calyx lobes and immature corolla. C. Calyx lobes. D. Corolla and anthers. E. Calyx lobes, nectar disk and pistil. (From *G. Quintana & V. García 13454*, US).

entire, 4 x 3 mm; stamens barely equaling upper corolla lip; capsule clavate, lower half stipiform, glabrous.

A rare cloud forest species at elevations between 2000 and 2600 meters, virtually restricted to the Amboro National Park. It flowers in the winter dry season from April to September.

Specimens examined: COCHABAMBA: Carrasco, *Wood & Serrano 14872* (K, LPB, US). SANTA CRUZ: Caballero, *I. Vargas 2949* (US, USZ), *Smith 13454* (LPB, MO, US).

Stenostephanus spicatus Wassh. & J. R. I. Wood, Harvard Pap. Bot. 6:450. 2001. TYPE: Bolivia, Tiraque, on old Cochabamba road from the Chaparé, above El Palmar, 1200 m, 6 Jul 1997, *J. R. I. Wood 12408* (holotype K; isotypes LPB, US-3352934). Fig. 39 (A-E).

Plant erect, branched perennial to 1 m high; stem glabrous, blackish-green, sometimes with pale vertical lines, swollen at nodes; leaves petiolate, blades oblong-elliptic, 3.5-16 x 1.5-5 cm, shortly acuminate at apex, glabrous or with a few trichomes on veins beneath, pale green but veins whitish or turning purple with age; inflorescence of simple terminal spikes arising on main stem or on shoots from uppermost leaf axils, 10-12 cm long, rachis glabrous or with a few short glandular trichomes, becoming purplish with age; flowers in opposite pairs, 4-7 mm apart; bracteoles triangular-ovate, 1.5-2.5 mm long; calyx ca. 3 mm long in flower, accrescent to 8 mm in fruit, 5-lobed, lobes linear, glabrous; corolla yellow-green, glabrous, 6.5 mm long, tube cylindrical, ca. 2 mm long and 1.25 mm wide, 4-lobed, upper lobe simple, oblong-lanceolate, tapered to an obtuse, coiled tip, 4.5 mm long, 1.25 mm wide, remaining lobes similar but not coiled; stamens exserted ca. 3 mm from corolla mouth, glabrous; capsule oblong, purplish, glabrous, 9.5-10 x 2 mm.

A very local species endemic to Bolivia growing in moist primary hill forest in the Villa Tunari area of the Chaparé between 750 and 1400 meters. Although all recent collections are within the Carrasco Park it would be wise to consider this species as threatened within the IUCN classification. It flowers in the winter dry season from May to July.

Specimens examined: COCHABAMBA: Chaparé, *Buchtien 2202* (US); Tiraque, *Wood 13664* (K, LPB, US), *Kessler et al. 7647* (GOET, LPB, US).

Stenostephanus tenellus Wassh. & J. R. I. Wood, Harvard Pap. Bot. 6:450. 2001. TYPE: Bolivia, Santa Cruz, Ichilo, by track from Río Yapacaní to Campamiento Mataratú, Amboró Park, 400 m, 25 Mar 2000, *J. R. I. Wood 16101* (holotype K; isotypes LPB, US). Fig. 39 (F-J).

Perennial herb; stems decumbent and rooting at nodes, then erect, to 50 (-70) cm high, dark-green, terete, scurfy pubescent; leaves anisophyllous, petiolate, blades oblong-elliptic or ovate-elliptic, 4-14 x 1.5-6.5 cm, acute or shortly acuminate at apex, sparsely pilose with scattered multicellular trichomes or subglabrous with a few appressed trichomes on veins beneath; inflorescence of usually solitary, terminal racemes but sometimes racemes panicled with 1-2 secondary racemes arising from base of inflorescence, racemes 6-20 cm long, rhachis scurfy-pubescent; bracts triangular-ovate, ca. 1 mm long; bracteoles similar; flowers shortly pedicellate in opposite pairs, 0.5-2.5 cm apart; calyx 5-lobed, 3-4 mm long, lobes narrowly lanceolate, glabrous; corolla pale lilac, 11-14 mm long, glabrous, tube cylindrical, ca. 7-10 mm long and 0.75 mm wide, limb 4-lobed, lobes strap-shaped, spreading, ca. 5 x 1 mm; stamens exserted ca. 5 mm from corolla mouth; capsule oblong-oblanceolate, glabrous, 9-13 x 2-3 mm.

Rare Bolivian endemic from three scattered localities in moist forest at low altitudes in the Andean region, between 300 and 1100 meters. It should be regarded as vulnerable within the IUCN classification. It flowers from about March to August.

Specimens examined: LA PAZ: Caranavi, *Seidel & Hirschle 2627* (LPB, US), *Wood & Daniel 18370* (CAS, K, LPB, US); Nor Yungas, *Wood & Mondaca 14570* (K, LPB), *14572, 16240* (K, LPB, US). SANTA CRUZ: Ichilo, *Nee & Bohs 49513* (NY, UCZ, US), *Wood 11368* (LPB), *12210* (K, LPB, US).

33. **Streblacanthus** Kuntze

Streblacanthus dubiosus (Lindau) V. M. Baum, Brittonia 34:433. 1982. - *Odontonema dubiosum* Lindau, Bull. Herb. Boiss., ser. II, 7:928. 1907. TYPE: Paraguay, Cordillera de

Fig. 39. A-E. *Stenostephanus spicatus*. A. Habit. B. Bracteole and calyx lobes. C. Corolla. D. Corolla expanded. E. Capsule expanded and seeds. F-J. *Stenostephanus tenellus*. F. Habit. G. Bracteoles and calyx lobes. H. Corolla. I. Corolla expanded. J. Capsule expanded and seeds. (A-E, from *J.R.I. Wood 12408*, US; F-J, from *J.R.I. Wood 12210*, US).

Villa-Rica, *Hassler 8573* (holotype B, destroyed; F photo 8735; isotype K).

Streblacanthus boliviensis Lindau, Repert. Spec. Nov. Regni Veg. 7:67. 1909. SYNTYPES: Bolivia, Santa Cruz, May 1892, without flowers, *Kuntze s.n.* (syntype B, destroyed; F photo 8792); Santa Cruz, Velasco, Florida, *Herzog 441* (syntype B, destroyed). Fig. 40.

Suffruticose perennial herb 0.5-1.5 m; stems erect, cylindrical, leaves in a basal rosette with apex consisting only of flowering spikes; leaves petiolate, blades broadly ovate 6-13 x 3-1O cm, glabrate, margin entire; inflorescence terminal, simple or branched, resembling a spike, loose, glandular-pubescent, pedunculate; bracts minute, green, entire; bracteoles smaller, puberulous; flowers sessile, 2 to 4 in verticils along spike-like axis; calyx 5-lobed, lobes equal, linear, glandular puberulous, 7-8 x 1 mm; corolla white, lilac or violet with a long slender tube, 20-35 mm long, pubescent, limb bilabiate, lower (anterior) lip 3-lobed, lobes 4-5 x 3-4 mm, rounded, upper (posterior) lip 4-6 x 1 mm, bifid; stamens 2, exserted; anthers 2-thecous, muticous at base; capsule clavate, pubescent, lower half stipiform, solid and sterile, head subcircular; seeds 2-4. Distinguished by its unusually long and narrow corolla tube.

Locally common in seasonally dry forest along the Andean foothills from Santa Cruz northwards and in the Chiquitano dry forest of the Pre-Cambrian Shield, from where it extends into Paraquay. It reaches only about 1000 m in altitude. It flowers in the winter dry season from May to September.

Specimens examined: PANDO: Abuná, *Vargas 660* (LPB, US); Manuripi, *Moraes 372* (LPB, US). BENI: Ballivián, *Beck 1689, 12193* (LPB, US), *Kessler et al. 10799* (LPB, US), *Seidel 2126* (LPB, US), *Wasshausen 2164* (LPB. US); Marbán, *Solomon 8171* (MO, NY, US). LA PAZ: Iturralde, *Wasshausen 2171* (LPB, US); Caranavi, *Wasshausen 2150, 2153* (LPB, US); Murillo, *Wasshausen 2112* (LPB, US); Sud Yungas, *Krukoff 10234* (K, MO, NY, US), *Beck 6849* (LPB, US). COCHABAMBA: Carrasco, *Kessler et al. 7896* (LPB, US); Chapare, *Wood 10082* (LPB, US). SANTA CRUZ: Ñuflo de Chávez, *Hopkins 164* (NY, US), *Wasshausen & Wood 2263* (CAS, LPB, US), *Wood 10007, 12544* (K, LPB, US); Ichilo, *Kessler et al. 8543* (LPB, US), *Nee 50188* (NY, US), *Ritter 3695* (US), *Solomon 14106* (MO, NY, US), *Vargas 5402* (US, USZ); Ibanez, *Wood 10094* (US); Florida, *Wood 8641* (K, US); Buenavista, *J. Steinbach 1556* (LIL, US); Sarah, *J. Steinbach 7393* (BM, MO).

34. **Suessenguthia** Merxm.

Shrubs, stems erect, quadrangular, sulcate; leaves opposite, short-petiolate, cystoliths conspicuous; flowers solitary or fascicled, usually large and conspicuous, borne in heads, spikes or cymes, the flower cluster subtended by small or often large and partly connate bracts, these sometimes colored; calyx 5-lobed, lobes subequal; corollas lilac or red, tube cylindric, 5-lobed, the lobes equal; stamens 4, didynamous, the longer two exserted, the shorter two included or barely reaching the throat of the corolla; anthers bithecous, longitudinally ciliate, mucronate at base; ovary disc minute, sessile; style glabrous; ovules 4 per locule. A genus of 6 species, these handsome flowering shrubs or treelets are often found growing over-hanging at the edge of streams.

Treatment of this genus adapted from Schmidt-Lebuhn, A.N. (2003). A taxonomic revision of the genus *Suessenguthia* Merxm. (Acanthaceae). Candollea 58: 101-128.

Key to the Species of **Suessenguthia**

1a. Flower heads arranged in cymes or thyrses, never with several heads arranged one above the other or if only a single head then sessile; inner bracts of the heads narrowly attenuate at base 2

1b. Flower heads arranged sympodially one above the other, inflorescence branched mostly at the base; inner bracts of the heads acute to slightly attenuate, but not with a long, slender apex 3

2a. Corolla pale pink, tube (20-)25-35 mm long, funnel-shaped towards apex, glabrous or rarely with a few, scattered trichomes, corolla lobes normally spreading forward ..... *S. multisetosa*

2b. Corolla deep pink, tube 35-45 mm long, sparsely to densely hirsute, corolla lobes slightly recurved to spreading at right angle to the tube ..... *S. wenzelii*

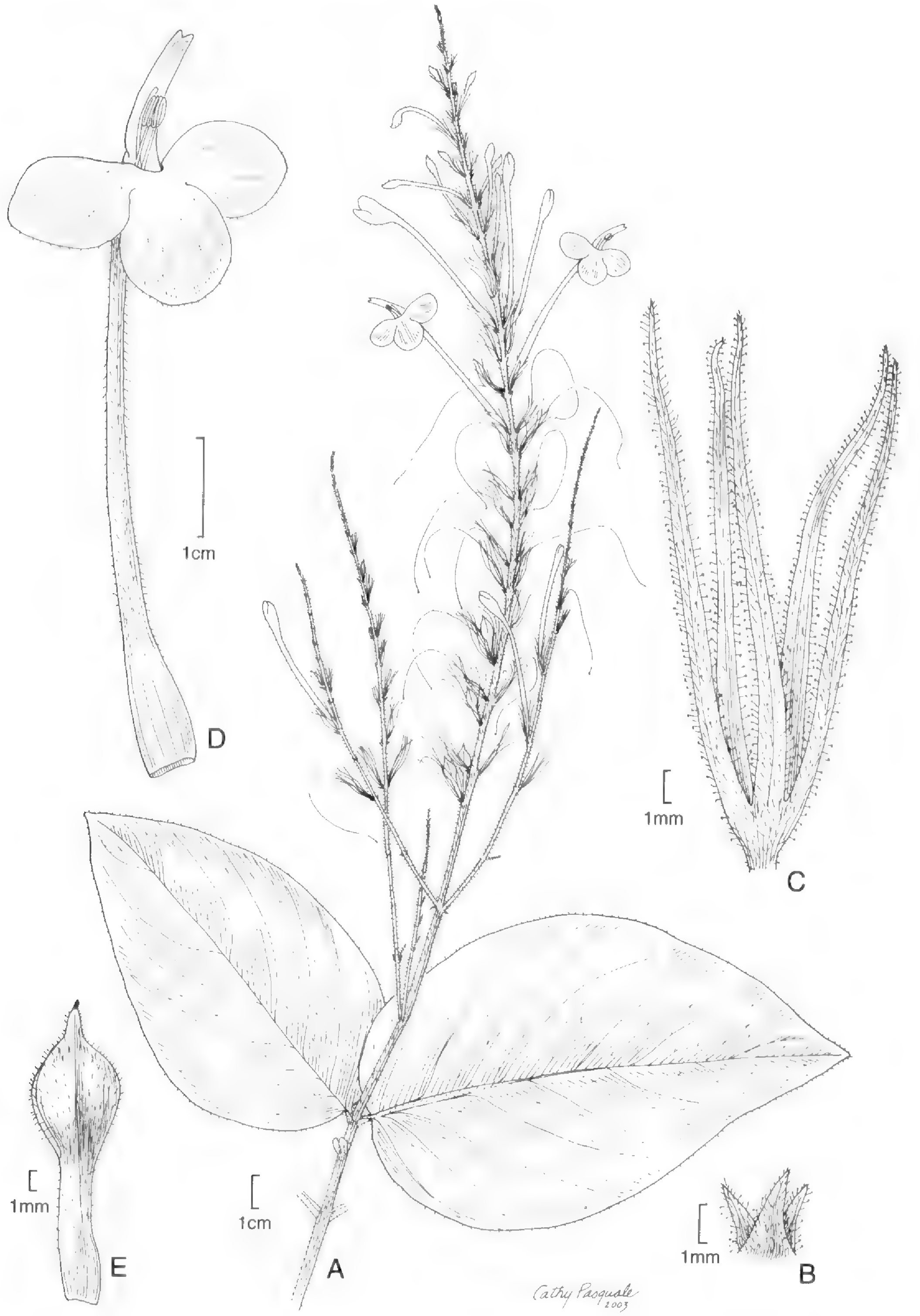


Fig. 40. *Streblacanthus dubiosus*. A. Habit. B. Bract and bracteoles. C. Calyx lobes. D. Corolla and anthers. E. Capsule. (From *D. Wasshausen & Wood 2153*, US).

3a. The two outermost bracts of a head glabrous or sparsely pubescent, apically always reddish, somewhat concave, slightly nitid and usually larger than the inner bracts; anthers included, rarely one pair slightly exserted ..... *S. barthleniana*

3b. The two outermost bracts of a head densely pubescent, often smaller than the nearest inner bracts, apically tainted red, flat; anthers at least reaching the mouth of the corolla tube, one pair usually exserted 4

4a. Flower heads excluding corollas (2.5)3-4 cm long: corolla pale red, rose lavender to deep pink, lobes erect, spreading to recurved ..... *S. trochilophila*

4b. Flower heads excluding corollas 2-3(-3.3) cm long; corolla deep red, lobes reduced, tightly struck back or revolute ..... *S. koessleri*

Suessenguthia barthleniana Schmidt-Lebuhn, Candollea 58:118. 2003. - *Suessenguthia trochilophila* auct., non Merxm. TYPE: Bolivia, Nor Yungas, 15 min. from Yolosa on road to Caranavi, 67°45'W, 16°13'S, 1100 m, 7 Aug 2000, *Schmidt-Lebuhn 29* (holotype GOET, isotypes LPB, US).

Shrub 0.8-4.5 m; leaf blades elliptic to slightly obovate, 16-20(24) x 5-7(9) cm, glabrous, below, margin slightly to conspicuously roundly dentate; inflorescence mostly branched basally, with upper portion consisting of sympodially arranged heads, internodes sparsely to moderately pubescent, heads excluding corollas 2.5-3.5(-4) cm long, bracts subtending floral cluster apically purplish, triangular-cuspidate, 1.7-3.5 x 1-2.8 mm, concave, glabrous or sparsely pubescent; inner bracts tainted red apically, (2-)2.5-3(-3.5) x 0.5-1.7 cm, sparsely pubescent; calyx lobes 2.5-3 x 0.2-0.5 cm, sparsely to moderately pubescent; corolla pale pinkish, tube 35-47 mm long, 7-10 mm wide, upper half sparsely to moderately pubescent without, lobes 10-14 x 5-8 mm, emarginate, slightly recurved; anthers included, rarely barely exserted.

Along rocky streams and along riversides at elevations between 680 and 1700 m. Valleys of the eastern Andean slopes west of the Río Tambopata on the eastern border of Peru, south to the Provincia Sud Yungas, La Paz in eastern Bolivia.

Specimens examined: LA PAZ: Tamayo, *Gentry & Foster 71144* (LPB, MO, US), *Helme 77* (LPB, US), *Wasshausen & Wood 2278* (CAS, GOET, K, LPB, US), *Wood & Wasshausen 16616* (K, LPB, US); Larecaja, Mapiri, *Buchtien 1403* (US), Guanay, *Rusby 1119* (NY, US): Nor Yungas, *Beck 13898* (LPB, US), *Wood & Wasshausen 13760* (K, LPB, US); Caranavi, Coroico, *Bang 2367* (BM, M, MO, NY, US), *Wasshausen & Wood 2140* (CAS, GOET, K, LPB, US); Sud Yungas, *Beck 4734* (LPB, US), *Krukoff 10186, 10585* (MO, NY, US).

Suessenguthia koessleri Schmidt-Lebuhn, Candollea 58:126. 2003. TYPE: Bolivia, Pando, Madre de Dios, cerca de Riberalto, 5 min abajo de Agua Dulce al borde de Río Madre de Dios, 66°13'W, 11°00'S, 140 m, 5 Sep 2000, *Schmidt-Lebuhn 50* (holotype GOET, isotypes LPB, US).

Shrub 1.5-4 m; leaf blades elliptic or slightly obovate, (23)14-18 x (7)4-6 cm, occasionally sparingly pubescent on lower surface, margin entire; inflorescence basally branching, upper portion bearing sympodially arranged heads one above the other or sometimes reduced to a single head, heads excluding corolla 2-3(-3.3) cm long; bracts subtending floral cluster 0.8-2.5 x 0.3-0.5 cm, very rarely to 4.5 cm long, glabrous and resembling a reduced apetiolate leaf blade, apically tainted red, densely covered with appressed trichomes; inner bracts tainted red apically, ovate to elliptic, 1.7-3 x 0.4-0.7 cm, densely covered with appressed trichomes; calyx lobes (1.7-)2-2.2 (-2.6) x 0.3-0.5 cm, densely covered with appressed trichomes, margin hyaline; corolla deep red, tube 35-45 mm long, 4-7(-9) mm wide, apically moderately to densely covered with trichomes, lobes 5-8 x 3-7 mm, recurved or revolute, margin sometimes irregular or slightly emarginate.

Occasional, lowland rain forest at margins of Ríos Madre de Dios and Madeira in the Department of Pando.

Specimens examined: PANDO: Manuripi, *Daly et al. 2038* (LPB, NY, US); Province unknown, W. bank of Río Madeira, *Prance et al. 6593* (NY, US).

Suessenguthia multisetosa (Rusby) Wassh. & J. R. I. Wood, Proc. Biol. Soc. Wash. 116:269. 2003. - *Ruellia multisetosa* Rusby, Mem. New York Bot. Gard. 7:362. 1927. TYPE: Bolivia,

La Paz, Huachi, *White 547* (lectotype NY, Schmidt-Lebuhn 2003: 110).

Shrub or subshrub 2-6 m; branches sharply quadrangular; leaf blades ovate, 15-18 x 5-10 cm, thick and drying brown, strigose, margin sinuate-dentate; inflorescence densely thyrsoid, sometimes accessory shoots, sometimes irregular or cymose with a few heads, seldom reduced to a single head, internodes minutely pubescent, heads excluding corollas (1.5-)2.5(-3.5) cm long; bracts subtending floral cluster green, ovate, 1-2.5(-3) cm long, apically attenuate to long-acuminate, purplish, moderately pubescent; inner bracts similar, 1.5-2.5(-3) x 0.3-0.9(-1.4) cm, its widest part below the middle, densely pubescent, slender-attenuate at apex, rounded to acute at base; calyx lobes similar to inner bracts, obtusely purplish, (1.5-)2-3(-3.5) x 0.2-0.4 cm, densely whitish-hirsute; corolla white basally turning rose-purple apically, tube 10 mm long, constricted at summit, throat campanulate, 30 mm long, lobes subequal, 15 x 10 mm, emarginate, slightly spreading forward; stamens barely reaching mouth of corolla tube.

Endemic to Bolivia and occurring sporadically in the Andean foothills NE of La Paz and west of Santa Cruz, particularly near Buena Vista but in local great abundance in Chiquitano dry forest near San Javier and Ascencion de Guarayos. This rather odd distribution is paralleled by *Aphelandra rusbyi*. It flowers in the winter dry season from May to September.

Specimens examined: La Paz: Cataracts of Río Bopi, *Rusby 706* (K, NY, US); Sud Yungas, *Seidel 2732* (LPB, US). Santa Cruz: Guarayos, *Balick 1416* (NY, US), *Wood 10000* (K, LPB); Ñuflo de Chávez, *Beck 12255* (LPB, MO, US), *Balick 1427* (NY, US), *Hopkins 160* (NY, US); Santiesteban, *Nee 47096* (NY, US); Ichilo, *Wood 14978* (K, LPB, US); Parque Nacional Amboró, *Nee 38188, 38877, 39049, 39250* (NY, US), *41783* (MO), *Solomon 14002, 14053* (K, MO, US), Buenavista, *J. Steinbach 1594* (LIL, US), *Nee 35499* (NY, US), *J. Steinbach 2636, 6328* (K); Ibáñez, *Saldias 3255* (MO, US, USZ), *Wood 12448* (K, LPB, US).

Suessenguthia trochilophila Merxm., Mitt. Bot. Staatssamml. Münch. 1:178. 1953. Type: Bolivia, Beni, Ballivián, Rurrenabaque, *Niethammer 208* (holotype M).

Suessenguthia leucerythra (Leonard & L.B.Sm.) Wassh. Rhodora 72:120. 1970. - *Sanchezia leucerythra* Leonard & L.B.Sm., Rhodora 66:318. 1964. Type: Peru, Junín, Río Paucartambo Valley, *Killip & A.C. Smith 25271* (holotype NY; isotype US-1359528).

Shrub or subshrub 0.8-5 m; stem glabrous; leaf blades lanceolate to elliptic to slightly obovate, 13-32 x 3.5-8.5 cm, firm, glabrous, attenuate at apex, gradually decurrent on petiole at base, margin entire to repand-crenate; inflorescence mostly branched basally, the upper portion consisting of sympodially arranged heads, sometimes reduced to only a few heads or a single head, internodes densely pubescent, heads excluding corollas (2.5 -)3-4 cm long; bracts subtending floral cluster maroon, narrowly ovate, 1.5-4 x 0.5-1.8 cm, sericeous; inner bracts tainted red apically, ovate to elliptic, (2-)2.5-4 x 0.4-1.7 cm, sericeous, acute to attenuate at apex; calyx lobes exceeding bracts, linear-lanceolate, 2.3-4 x 0.2-0.6 cm, sericeous; corolla pale red, rose lavender to deep pink, tube (35-)40-45 mm long, 6-10 mm wide, upper half to three quarters densely retrorsely pubescent, lobes 8-15 x 4-10 mm, erect, spreading to recurved, emarginate; stamens cream-white, longer 2 exserted 7-10 mm beyond mouth of corolla.

Occasional, edge of lowland rain forest, observed visted by *Phaethornis* hummingbirds. Also found in Peru and Amazonian Brazil.

Specimens examined: Pando: Manuripi, *Sperling & King 6582* (LPB, MO, NY, US), *Jardim 2303* (MO, US). Beni: Ballivián, Rurrenabaque, *Rusby 850* (NY), *Williams 991* (NY, US, USZ). La Paz: Iturralde, Tumupasa, *Vargas 1115* (US), *Wasshausen & Wood 2174* (CAS, GOET, K, LPB, NY, US).

Suessenguthia wenzelii Schmidt-Lebuhn, Candollea 58:112. 2003. Type: Bolivia, Beni, Puente Río Quiquibey, 400 m from the bridge in the direction to Yucumo, 67°07'W, 15°23'S, 700 m, 10 Sep 2000, *Schmidt-Lebuhn 63* (holotype GOET, isotypes LPB, US). Fig. 41.

Shrub or treelet to 4 m; leaf blades elliptic to narrowly obovate, to 12 x 3.5 cm, lower leaves presumably much larger, glabrous or lower leaf surface sometimes pubescent, apically attenuate, narrowed at base and decurrent into petiole, margin entire; inflorescence a thyrse, sometimes with

Fig. 41. *Suessenguthia wenzelii*. A. Habit. B. Capsule. C. Calyx. D. Corolla (A, from *Wasshausen & Wood 2157,* US; B-D, from *Wasshausen & Wood 2265*, US).

accessory shoots, seldom reduced to a single head, often irregularly branched, internodes densely pubescent, heads excluding corollas 2-3.5 cm long; bracts subtending floral cluster 0.9-2.3 cm, ovate, moderately pubescent; inner bracts (1.5-)2.5(-3.5) cm x 0.5-0.7(-1.2) cm, its widest part below the middle, densely pubescent, slender-attenuate at apex, rounded to acute at base; calyx lobes 2.5-3.5 x 0.2-0.4 cm, densely pubescent; corolla deep pink, tube 40-45 mm long, 5-9 mm wide, tubular, sparsely or densely pubescent, either apically or along its entire length, lobes 13-19 x 7-11 mm, spreading or slightly recurved, emarginate.

Occasional, rain forest along roadside ditches at about 700 m elevation. According to Schmidt-Lebuhn (2003) the species appears to be of hybrid origin. The population at Puente Río Quiquibey, which consists of about a dozen individuals, appears to be genetically stable and is located at the northern edge of the Bolivian Yungas.

Specimens examined: Beni: Ballivián, Puente Río Quiquibey, *Schmidt-Lebuhn 64* (GOET, LPB), *Schmidt-Lebuhn 66* (GOET), *Wasshausen & Wood 2157* (GOET, LPB, US). Santa Cruz: Ñuflo de Chávez, *Wasshausen & Wood 2265* (US).

35. **Tetramerium** Nees

Tetramerium wasshausenii T.F. Daniel, Syst. Bot. Monogr. 12:71. 1986. Type: Peru, Lambayeque, Lambayeque prov., between Chongoyape & Llama, *Ferreyra 8390* (holotype US-A2577601). Illustration: 1986. Syst. Bot. Monogr. 12:73.

Illustration: 1986. T. F. Daniel, Syst. Bot. Monogr. 12:73.

Perennial herb or subshrub to 45 cm; stems terete to subquadrangular, pubescent, with exfoliating epidermis; leaves petiolate, blades lance-ovate to ovate to subdeltate to subcordate, pubescent, margin entire; inflorescence of densely bracteate spikes; bracts green, erect to spreading, lance-elliptic to ovate-elliptic to ovate, pubescent, margin entire; bracteoles 2; calyx 5-lobed, lobes lance-subulate to subulate, pubescent; corolla blue, 17-22 mm long, glabrous, tube cylindric, limb bilabiate, appearing 4-parted, upper lip emarginate apically, lower lip 3-lobed, lower-central lobe conduplicate; stamens 2; anthers 2-thecous, the thecae red or maroon, turning blackish with age; capsule stipitate, 6-9.5 mm long, glabrous, head ellipsoid to obovoid, terminating in a short beak; seeds 4 (or fewer by abortion).

This species is known only from the dry coastal region of northwestern Peru and dry forest in the Andean foothills of Bolivia where its distribution recalls that of *Oplonia jujuyensis* and *Schaueria azaleiflora*. This disjunct distribution suggests it may relic from a wider distribution in former pleistocene dry forest. It flowers in April to June.

Specimens examined: La Paz: Nor Yungas, *Beck 21294A* (LPB). Cochabmba/Santa Cruz: Campero/Caballero, on both sides of Río Mizque by bridge, *Wood 13620* (K, LPB, US). Santa Cruz: Florida, Pampa Grande, *Acevedo 4460* (US), Puente Taperas, *Cárdenas 5802* (BOLV, US). Tarija: Villamontes, *Pflanz 4136* (US).

36. **Thunbergia** Retz.

Herbaceous or shrubby, pubescent or glabrous climbers, rarely erect, lacking cystoliths; leaves petiolate, simple, opposite, ovate to lanceolate, cordate or hastate basally, acute to acuminate apically; flowers pedicellate, mostly large and showy, blue, yellow or white, solitary, axillary or in terminal racemes; bracts 2, large, foliaceous, ovate or lanceolate; bracteoles 2, spathelike, enveloping calyx, mostly persistent; calyx cupuliform with 10-16 subulate lobes or reduced to a ring; corolla infundibuliform, tube incurved or oblique, widened above, limb spreading, 5-lobed, lobes subequal, obtuse or truncate, contorted in bud; stamens 4, didynamous, inserted near the base of corolla tube; anthers bithecous, the thecae oblong or ovoid, parallel, ± unequal; ovary fleshy, globose, bilocular, each locule with 2 collateral ovules; style long, stout; stigma bifid, entire or fringed; disc shortly annular or pulvinate; capsule globose below, abruptly beaked in upper part, 4-seeded, loculicidally dehiscent, hook-like funicles (retinacula) absent; seeds semiglobose to ovoid, glabrous, the funicle papilla-like. A paleotropical (mostly African) genus of between 100 and 200 species. Presently about 9 species are cultivated in the Americas where some persist as escapes and become naturalized.

Key to the Species of **Thunbergia**

1a. Petioles conspicuously alate; corolla orange (rarely yellow or white) with a dark purple internally glandular throat ..... *T. alata*
1b. Petioles naked; corollas not colored as above, lacking internally glandular throat 2

2a. Calyx bearing 12-17 slender, subalate lobes ..... *T. fragrans*
2b. Calyx annular, unlobed 3

3a. Leaves narrow (2.3-3.5 times longer than wide), rounded to subcuneate at base, major veins 3, margin entire to subsinuate ..... *T. laurifolia*
3b. Leaves broad (1.1-2.3 times longer than wide), cordate (to truncate) at base, major veins 5-7, margin conspicuously toothed or lobed ..... *T. grandiflora*

Thunbergia alata Bojer ex Sims, Bot. Mag. 52:t. 2591. 1825. TYPE: based on plants cultivated by R. Barclay from seeds from Mauritius. Fig. 42.

Herbaceous vine; stem subquadrate to flattened, pubescent; leaves petiolate, the petioles winged, blades sagittate, 2-13.5 x 0.9-8.5 cm, pubescent, cordate-hastate basally, margin entire to undulate; inflorescence solitary dichasia in leaf axils, pedunculate; bracteoles green, lance-ovate to ovate, 11-25 x 4-15 mm, pubescent, rounded to truncate to cordate basally; calyx reduced, annular, 11-13 lobed; corolla orange or yellow with dark purple glandular "eye", in throat, 25-43 mm long, limb subactinomorphic, lobes obovate to obdeltate, apically truncate; anthers appendaged basally; capsule estipitate, with expanded seed-bearing portion at base, pubescent, distally prominently rostrate, retinacula absent; seeds 2.

This native of East and South Africa is cultivated for ornament and has become naturalized in all the warmer parts of the world.

Specimens examined: BENI: Ballivián, Reyes, cult., *Cárdenas 5399* (BOLV, US). LA PAZ: Coroico, *Beck 21294* (LPB, US). SANTA CRUZ: Ibáñez, Santa Cruz, cult., *Peredo s.n.* (LIL, US).

Thunbergia fragrans Roxb., Pl. Coromandel 1:47. 1796. TYPE: India, Madras, according to protologue, plants were encountered near Samulcotah. Specimens upon which illustration was based not found, illustration itself might be type of species.

Herbaceous, pubescent vine; leaves petiolate, the petioles naked, blades ovate to narrowly ovate-dentate, 2.7-11 x 0.9-6.6 cm, truncate to subcordate at base, pubescent, margin entire or remotely few-dentate toward base; inflorescence axillary, pedunculate, 1-2- flowered; peduncles 2-7 cm long; bracteoles lanceolate or ovate-lanceolate, 11-18 x 5.5-11 mm, green, pubescent; calyx reduced, 14-17 lobed, lobes subulate; corolla white, 25-50 mm long, limb subactinomorphic, lobes broadly elliptic, crenate, nearly as long as tube; anthers lacking basal appendages; capsule with depressed-globose base, tipped by a stout flattened subulate beak 10-15 mm long.

This native of India is widely cultivated for ornament elsewhere and has become naturalized in the American tropics.

Specimens examined: PANDO: Suárez, *Fernández 8351* (MO).

Thunbergia grandiflora (Roxb.) Roxb., Bot. Cab. 4:t. 324. 1820. TYPE: picture in Bot. Reg. 6:495 (1820), neotype selected by Wood (1994).

Woody vine; stem subquadrate to quadrate-sulcate, pubescent; leaves petiolate, blades ovate to subcircular, 11.5-15 x 5.3-13.5 mm, pustulate and pubescent, cordate basally, margin coarsely and irregularly angular lobed below middle; inflorescence of many-flowered pedunculate dichasiate thyrses from leaf axils; bracteoles often coherent on posterior side, ovate-elliptic to obovate, 34-47 x 16-22 mm, pubescent, truncate at base; calyx annular, unlobed; corolla light purple or white with yellowish throat, 62-80 mm long, glabrous, limb subactinomorphic, lobes subregular, subelliptic, apically subtruncate; anthers appendaged basally; capsule not seen.

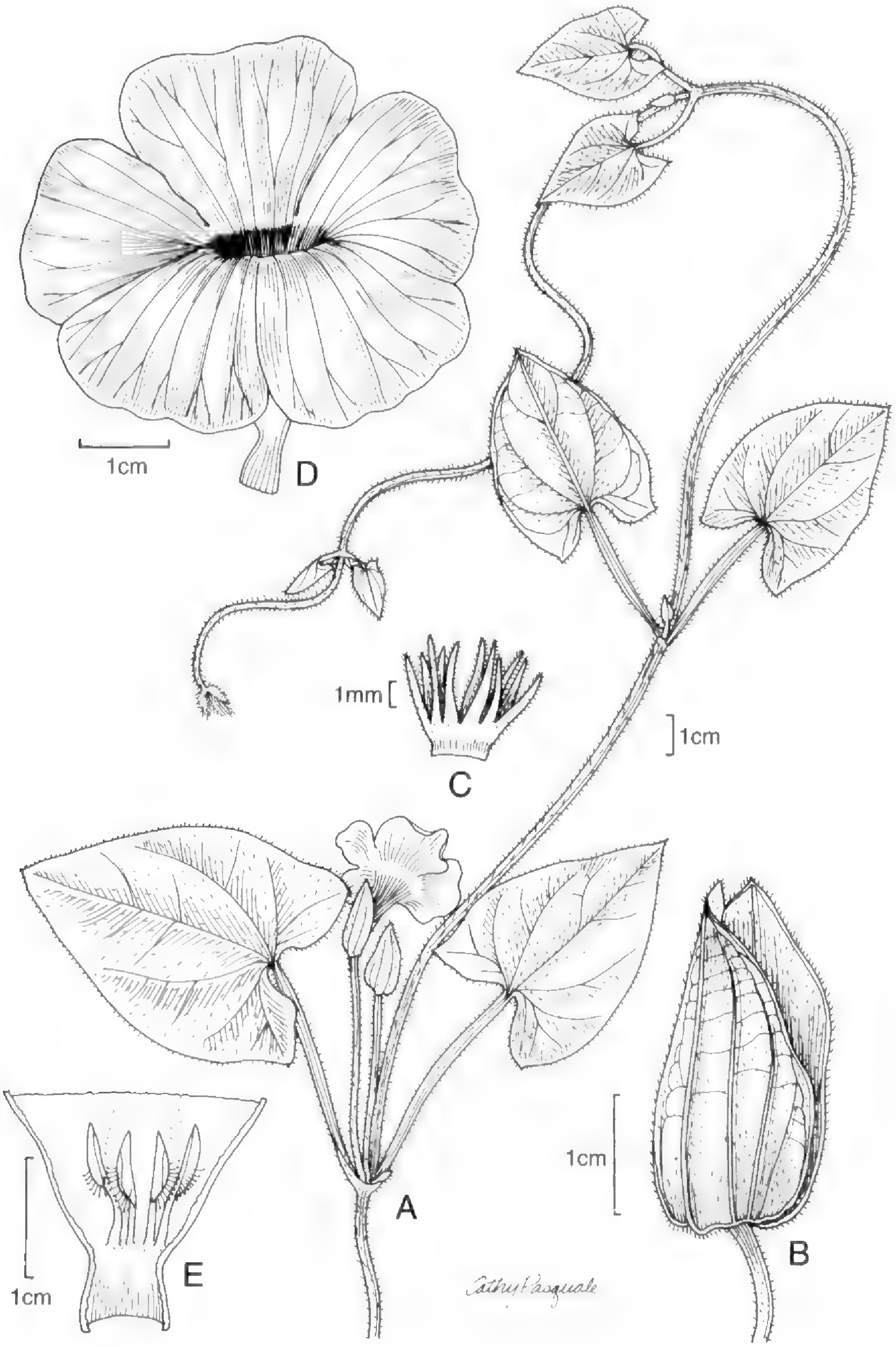


Fig. 42. *Thunbergia alata*. A. Habit. B. Bracteoles. C. Calyx. D. Corolla. E. Corolla expanded. (A, from *Lau & Cory 2475*, US; B-E, *D. Wasshausen 1079*, US).

A native of northeast India and Burma, this showy flowering vine is often planted for ornament in tropical or subtropical regions where plants sometimes persist or escape.

Specimens examined: BENI: Ballivián, *Beck 5360* (LPB, MO).

Thunbergia laurifolia Lindl., Gard. Chron. 1856:260. 1856. - *Thunbergia grandiflora* var. *laurifolia* (Lindl.) Benoist in Lecomte, Fl. Indo-Chine, 4:618. 1935. TYPE: according to protologue, material was cultivated by J. Veitch & Son, but Hooker (Bot. Mag. 83:t. 4985. 1857) disagreed as to source: specimens, if any exist, not seen.

Liana, young stems subquadrate to quadrate-sulcate, pubescent; leaf blades ovate to subcircular, 6.5-15 x 3.8-13.5 cm, pustulate and pubescent, cordate to truncate basally, apically acute to acuminate, margin coarsely and irregularly angular-lobed below middle; inflorescence of dichasia in axils of leaves or reduced leaves in a terminal thyrse; dichasia opposite, 1-2 per axil, pedunculate; proximal bracts sessile to subsessile, ovate, 25-41 x 10-15 mm, distal bracts reduced in size; bracteoles often coherent on posterior side, ovate-elliptic to subelliptic, 30-42 x 15-20 mm, pubescent; calyx annular, unlobed, 1-1.5 mm long, pubescent; corolla white with a hint of lavender without, lavender on the limb within and creamy yellow within tube, 55-80 mm long, glabrous without, limb subactinomorphic, 50-65 mm in diam., lobes subelliptic to subcircular, 23-28 x 22-33 mm; anther thecae of anterior pair of stamens each with an awnlike basal appendage, thecae of posterior pair with 1 thecae with an awnlike basal appendage, other theca either lacking a basal appendage or with a much shorter appendage. *T. laurifolia* is closely related to *T. grandiflora* and is distinguished only by differences in foliar morphology.

Apparently native to Malaysia and Burma, now cultivate worldwide.

Specimens examined: LA PAZ: Sud Yungas, cultivated or persisting, *Wood 8606* (K, LPB).

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